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Nature in Avon

Volume 64

Bristol Naturalists' Society

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NATURE IN AVON

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Volume 64 for 2004

Edited by Richard Bland

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Editorial

R.L.Bland

I have to start with an apology. There was no Invertebrate report for 2003, the result of an editorial oversight. It is printed this year, so that insects play a big role in this volume. There is no theme to this volume, but there are a series of articles involving water, of which perhaps the most original is Dr Stanton's notes on the hot springs of the River Avon. Clifton's existence was based on the development of Hotwells, and it is good to know that the spring still runs.

The creation of an Avon BAP is perhaps the most important wildlife event of 2004. The BNS is a partner in this exercise, in which Britain is a world leader. There is an article by Jenny Hayward who has created the structure describing the scheme and how it works. The notion of creating action plans for particular species and habitats, and setting targets to achieve them may rather bizarre to some of us, but this process is being driven by the government who want to create a better world for both people and wildlife, but also want to be assured that their efforts are making a difference. After all, taxes are our money. It also makes the important point that, just as our actions can destroy habitats and their wildlife, we can if we wish also create habitats and enable wildlife to expand. The increase in Red Kites is a fine example of effective management of a rare species. The expansion in Peregrines is a natural consequence of the banning of the use of the chemical poisons that were destroying them.

Monitoring the effects of the BAPs is a key part of the process, and members of the BNS have the time and expertise to assist in this process. But it also affects us as citizens. The process of rebuilding biodiversity, and putting this at the centre of policy and decision- making, is vital, not just for the future of wildlife, but also for the future of humanity. We depend upon the ecosphere, and we have no future that is not a sustainable future.

There are probably many typographical errors below which I have failed to spot for which I apologise.

Richard Bland Editor.

Weather report for 2004

R.L.Bland
11 Percival RD BSA8 3LN Richardbland@blueyonder.co.uk

From 1920 to 2002 weather data was recorded by Long Ashton Research Station, and all the long-term figures below use that data. As that station closed at the end of 2002, the data for 2004 have been taken from the daily figures supplied to the Times newspaper for Bristol, and they may not be exactly compatible with the previous series. I believe that the differences are too small to be of significance.
Additional research has pushed the records for rain back to 1853 and for temperature to 1881, though there are gaps in the record between 1907 and 1920. To understand present trends it is important to have as long a series for Bristol as possible.

Annual Temperature.
The annual mean maximum temperature was 14.3 C. Graph 1 shows the figures for the past twenty years, and, and the decadal trend line, in which each point is the average of the previous decade. The overall mean since 1881 is 13.8C.

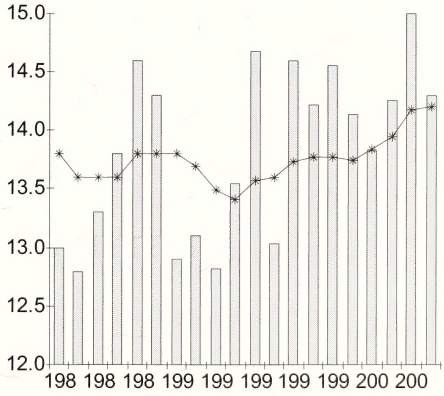
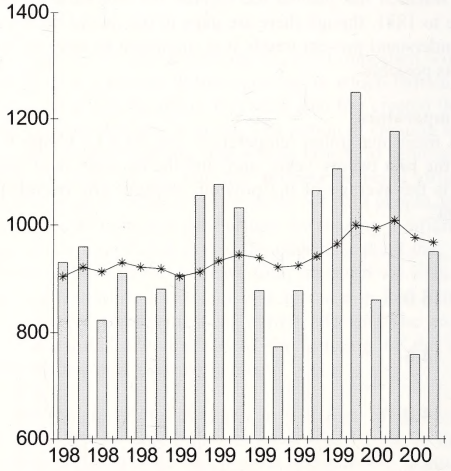


Chart 1. Annual mean maximum temperature for the past twenty years. The line shows the decadal trend.

Annual rainfall.
Graph 2 shows the rainfall for the past twenty years, and the decadal trend line. The annual average since 1853 is 890mm, whereas the figure for the past ten years is 970mm, largely because of the exceptional rainfall in 2000. The rainfall of 951mm in 2004 is 7% above average.



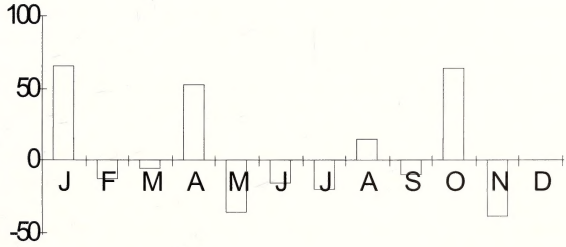
Graph 2 Annual rainfall in mm for the past twenty years and the decadal trend.

Monthly Temperature
Two months, July and October, were below the long term average. January and February were more than 10% above average, though both were within the normal standard deviation. Graph 3 shows the percentage differences.

Graph 3 Percentage difference between monthly mean maximum temperatures in 2004 and the 1885-2003 average.

Monthly rainfall

Two months, January and October had exceptional rainfall totals in that they lay beyond the standard deviation, which for most months is around 50%. May June and July were all dryer than normal, with up to three weeks without rain, and unusually there was no rain between Nov 29th and Dec 15th.



Graph 4 Percentage difference between monthly rainfall in 2004 and the average 1853-2003

Monthly summary
Table 1 shows the monthly temperature and rainfall figures, compared with the long term average. There follows a brief summary of other features of each month.

January The month began with a cold snap and a minimum temperature of 3C on 3rd. Icelandic lows brought heavy rain and higher temperatures until 16th, when the Azores high brought NW winds , sharply lower temperatures, and snow on 28th which froze. Twelve frost nights in all.
February Began with a storm and a warm spell that saw a temperature of 16C on 4th, but high pressure then developed with lower temperatures and light winds until 21st when strong N winds brought snow to Bristol on 26th, and ponds remained frozen until the end of the month. There were nine frost nights.
March Dominated by high pressure until 12th, then westerlies took charge. The month ended with light N winds. The 12-14th had southerly winds that saw a rush of early migrants.
April A see-saw month, with bursts of rain on 3-4th, 17-18th and 29-30th, with long periods of NW winds in between. This did not encourage bird migrants who were generally late, though southerly winds on 23-24th saw a rush.
May A dry month dominated by a ridge of high pressure from Azores with light winds from 10th-27th. Temperature reached 23C on 16th, but subsequently was around 19C.
June A hot start with a maximum of 27C on 7th, 8th, but from 16th there was a succession of weak lows, with light W winds, and low temperatures of around 17C. On 23rd 26mm of rain fell breaking what was in effect a six week drought
July A distinctly cool month, which had a last minute hot spell, and 26C on 29th It began with a westerly airstream, which became NW from 9th, and from mid month a cloudy period with light winds.
August. Complex and stationary lows encouraged thunderstorms and a lot of rain. Rather wet, though less so that the rest of the country. Hottest day of the year 28C on 7th.
September Began dominated by high pressure, but after 7th westerly winds took over, but brought little rain.
October Exceptionally wet month with series of depressions and westerly winds. Very strong S winds in last week.
November. High pressure and N winds for first three weeks, but in last ten days westerly took charge.
December. Dry in first two weeks, and dominated by E winds around

Baltic high. In second half W took over, rain fell, and snow fell on 19th. There were 7 frost nights, one producing ice on ponds.

	Avg Daily Max	Avg 1885-2003	Diff	Total rain	Avg 1853-2003	Diff
	C	C	%	MM	MM	%
January	8.1	7.3	11	137	83	65
February	8.6	7.6	13	54	62	-13
March	10.2	10.1	1	57	60	-5
April	13.1	12.8	2	89	58	53
May	17.1	16.2	6	39	61	-36
June	20.1	19.3	4	51	61	-16
July	20.1	20.8	-3	57	71	-20
August	21.6	20.5	5	98	85	15
September	19.2	18.1	6	72	79	-9
October	13.8	14.2	-3	157	95	65
November	10.8	10.3	5	54	97	-38
December	8.5	7.9	7	86	86	0
Year 2004	14.3	13.8	3	951	890	7

Table 1 2004 Monthly mean maximum and rainfall figures compared with the long-term average from 1885 and 1853 to 2003.

Some weather extremes of 2004

Wettest day	Dec 19th	29mm
Hottest day	Aug 7th	28C
Coldest day	Jan 3rd	3C
Sunniest day	May 24th	14.1 hrs
Longest cold spell	Feb 23rd to Mar 2nd	9 days
Longest dry spell	June 1-19	19 days
Longest wet spell	Oct 12-25th	14 days.
Frost nights, total	31 nights	
Last frost	Apr 9th	
First frost	Nov 11th	
Days snow lying	8	

Sand Bay 2005

Tony Smith
30 Timberdene Stapleton BS16 1TJ

Comes and goes the tide

With ceaseless motion comes and goes the tide,
Flowing, it fills the channel vast and wide;
Then back to the sea with strong majestic sweep
It rolls in ebb yet terrible and deep;
Here samphire banks and Saltwort bound the flood,
There stakes and seaweeds withering on the mud
And higher up, a ridge of all things base,
Which some strong tide has rolled upon the place.

George Crabbe, 1754-1832

1. Destruction of the environment

First I must tell you about the experiment set up by Hazel Willmott. She viewed with perplexity the Local Authority beach-cleaning machine that sucked up the sand every fortnight throughout the summer on Sand Bay. She looked at the remaining strandline that was not cleaned away and found it teeming with sandhoppers. The strandline was an important habitat and was being carelessly cleaned up. Her concept was clear, simple and masterly and it enabled her to show the stark reality of tidying up the environment without scientific understanding of the importance of "a ridge of all things base". This was made so clear that the sleeping giant of English Nature was prodded into wakefulness and commissioned two follow-up surveys. Here, in the Bristol Channel, "where samphire banks and Saltwort bound the flood", with shifting banks of sand and one of the highest tidal ranges in the world, the environment was being sanitised. The Bristol Channel, at the same time as being an important migratory route for wildfowl, Eel and Salmon and an important feeding area for waders and other birds is also important for industrial and commercial uses, waste-dumping, sand and aggregate extraction and, as the beach-cleaning showed, leisure interests by man.

2. Her work woke people up!

In 2000 the local authority ceased beach cleaning at Sand Bay and teams of volunteers were sought among the residents to hand pick rubbish (considering separately the impact of the really large items) and Hazel got her very well-deserved MSc from Bristol University. Subsequently, Hazel

asked a meeting of the Council of the Bristol Naturalists' Society if anyone would like to carry out a follow-up study, funded by English Nature, to see if wildlife was benefiting from having stopped beach cleaning. I offered because I had some previous form.

3. Hazel's groundbreaking study and its sequel

In the first study of the strandline at Sand Bay by Hazel in 1999 the 3km length of the beach was divided into three zones; a southern 250m zone (S) that had never been cleaned mechanically, a cleaned, central zone of 2000m (C) that had had regular cleaning by machinery for nine years and a no-cleaning, saltmarsh-dominated, zone of 750m to the north (N). Today, because of growth of the saltmarsh and cessation of mechanical cleaning, if you go to Sand Bay it may not be so clear that there are these "natural" divisions that Hazel and I used in our respective studies.

4. The experiment

Hazel studied the numbers and variety of tiny shrimps, (sandhoppers, or more correctly, amphipods) living in the tide-floated rubbish along the beach and she tried to link this to the decline in wildfowl numbers that was the concern of Governments, Quangos and naturalists alike. She took fortnightly samples of amphipods at random positions from April to July and the growth of the population was studied. The results were astonishing. Where mechanical cleaning was carried out there was an almost complete absence of amphipods but adjacent, within a few metres, they were abundant. The rubbish that these sandhoppers were inhabiting is properly called the strandline and it is more-or-less continuous along the beach and represents the highest point reached by the most recent high tide. It consists of flotsam, fronds of seaweed, twigs, other bits of wood and indeed anything that floats including bottles, toys, syringes, sanitary materials, kitchen units, tyres, oil drums, even tree trunks. No wonder it is thought to be a good idea and no harm to remove these things on a regular basis.

But many studies elsewhere have shown the tremendous importance of the strandline for dune building, seedling growth, conservation, coastal defence in general, conservation of rare plants and as an invertebrate habitat containing rare beetles and hemipteran bugs. In order to show the importance of tiny amphipods to birds, Hazel did a parallel study of the ornithological records of the abundances of wintering waders in Sand Bay to see whether there was evidence of changes in numbers over the previous ten years. However these birds normally feed out on the estuarine mudflats, not the strandline, and their winter populations are controlled by factors unrelated to the state of the strandline. Passerine and other species that do use it will be discussed later.

5. The method

My study in 2002 followed Hazel's method almost exactly. In the three divisions of the strandline, three random samples were taken. At each "station" it is important to make notes of the conditions, of wind, weather and temperature and the condition of the seaweed and the size of stones and gravel. The seaweed may be dried or moist and it may be decaying into a rich humic mess that the sandhoppers simply abound in. At each random point I put down a bottomless wooden box, whose sides were 15cm high. This is the "quadrat" and it is approximately 33cm X 33cm and covers exactly one ninth of a square metre. As soon as the quadrat is put down one has to scoop out, with both hands, (wearing plastic gloves) every bit of seaweed, seashell, twig, pebble, shingle, sand and plastic bag that is the strandline material and dump it into a bag or lidded bucket that one has brought along for this purpose. In all this rubbish will be the sandhoppers. They jump about and this is the reason for using a high-sided box rather than the traditional, flat, pegged out, quadrat. To make sure that I obtained all the sandhopper population I dig down until there are no signs of sandhopper activity. I collected nine samples a session, each containing up to 10kg of material.

6. Finding the sample points

The date of the session is decided by reference to tide tables and I use a handy reckoner called *QuickTide*. The procedure is to sample two or three days after the spring tide (there are two spring tides every month), just after the peak of high tide and go along the beach, stopping at the nine random positions. You can measure the positions of way-marks, the bus-shelters, roof-lines, wartime pill-boxes, power line posts and sign posts along the road and use them as reference points that you can see from the beach. This methodology allows for repetition without damage and the randomness ensures that every single sample is statistically the same as any other. Each sample is treated in the same way so that the population of sandhoppers can be separated from the rubbish, identified and counted.

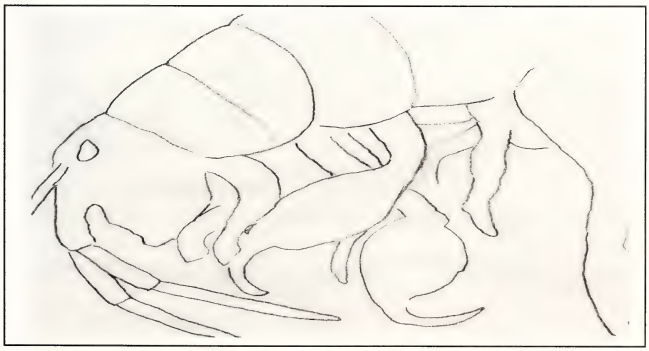
7. The strandline

I hope the reader can understand the enormous length of the strandline and how small is the sample from that length. It is important in any scientific study of a habitat that the work you do does not make a difference to that habitat. The strandline is about 100cm wide and may consist of more than

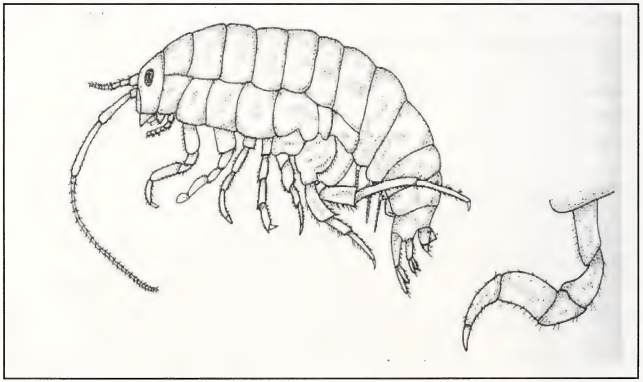
one strand because there will have been several tidal flows since the highest spring tide two days previously and material is deposited according to the force or lack of it in the waves. In notes made at each station, presence of sandhoppers was recorded for all strands of the strandline. Hazel and I took the strand of the highest tide unless it was thin and dried and was without sandhoppers, so a lower strand was used. To handle the sample back at home, I used 65°C hot water poured on to the material in the bucket and then sieved. Wet sieving had to be used making the sample manageable, so that, although both substrate and sandhoppers were retained by the different sieves, one could separate them by and large by decanting and flotation. I sieved and decanted the whole material through coarse, medium and fine sieves, picking out the individuals with light forceps. Sandhoppers were put directly into 70% industrial methylated spirit in 25ml, 100ml or 250ml screw-capped, labelled containers for later identification. Hazel's method involved slowing down sandhopper activity using a refrigerator overnight and then collecting into methylated spirit.

8. Identification characteristics

In the field you can catch sandhoppers and temporarily detain them for identification if you sandwich them against a piece of Clingfilm©. This is achieved by taking a pair of disposable carbonate drinking cups, cutting off the base of one, wrapping the film over it using sticky tape and then pushing the other cup inside whereupon you have your viewing chamber between the base of one cup and the film on the other. When you have hundreds of amphipods to examine this is inadequate, and I used a low magnification binocular microscope on a table at home with the samples in flat petri dishes.



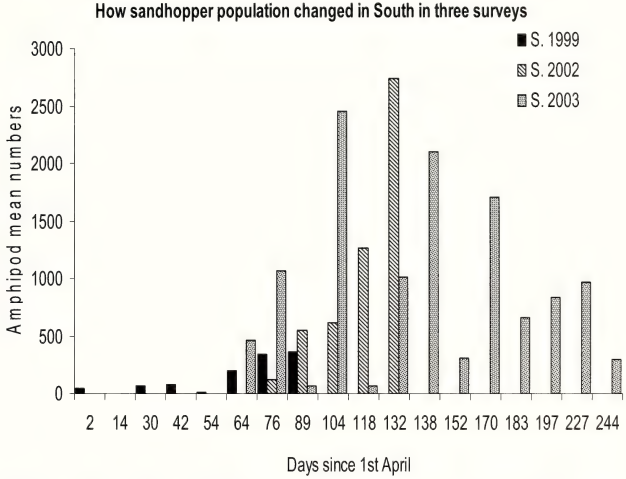
An amphipod sandhopper is a crustacean with a deep but narrow body, more correctly described as being laterally flattened. This shape of body is similar to that of the flea and facilitates progress through narrow spaces between pebbles or seaweed fronds. Amphipods are segmented and have paired limbs on every segment, even their mouthparts are modified paired limbs. They are called sandhoppers because at least one pair of those limbs possesses wide, muscle-filled thighs (femora) that enable frequent, rapid, hopping activity, and they live on beaches. Each of the limbs along the body scratches and picks at the organic material in the strand line breaking it down so they can feed on small scraps. They are typical detritivores. Two pairs of their claws are pincers and the second pair in the male is so characteristic that the naked eye or a X10 hand lens can identify them. Amphipods have a pair of eyes in the form of two collections of simple, fixed, crystalline eyes on either side of the head and the head bears two pairs of antennae. Amphipods are obviously marine but their life is almost wholly terrestrial, being kept damp by the moistness of the seaweed. There are different species of amphipod that live in fresh-water, brackish-water and sea-water. In the strandline there are three marine species.



9. Population changes

I carried out the third study, again at the request of English Nature, to monitor the progress of the recovery of sandhopper numbers in the season of 2003. It started in May and continued through to September and it showed that the numbers of individuals increased, confirming the great explosion of numbers of late summer. The five month survey was extended,

first to Christmas and then to a year-long survey, showing in general that there was a much-increased population in 2003/2004 compared with the previous surveys, confirming an increase into late summer and followed by a decline in the colder months. See graph 1 below. Other invertebrates of the strandline were also identified and they also showed variation in abundance with the seasons. All I know is that each spot is treated to an identical method of time, state of tide, collection, sorting and treatment. Lower numbers may indicate lower collecting efficiency; higher numbers show that the job is being done better.



Graph 1 Sandhopper populations on the southern stretch of Sand Bay, 1999, 2002 and 2003

10. How many sandhoppers?

It is not possible to work out the population of hoppers on a strandline in an exact way. All one can do is to sample the beach in exactly the same way each time and then it is possible to say how the population varies from season to season over a year, and from year to year. In this way one can be sure about certain things about the population such as the times when juveniles are born and see that the population has larger and larger adults as the months pass. It would be impossible to collect all the individuals, even

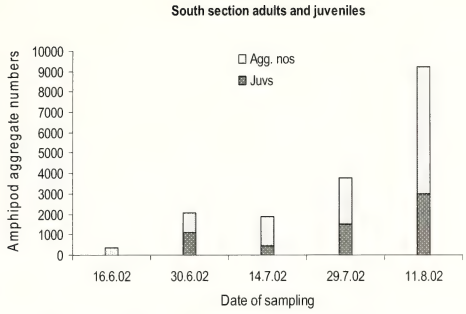
if you could somehow vacuum up the entire strand, separate the animals and have some means of counting them all. A walk along the beach often reveals, near the strand material, perhaps near rocks in the sand, assemblies of tiny pale, raised-rimmed holes that are "fox-holes" of individuals; juveniles nearer the top of the beach, large males further down. Occasionally, a bit of flotsam, such as small branch or a sheet of plywood not carried as far as the full tide flow will cover a few hundred sandhoppers. Isolated bits of damp seaweed may carry out the same function of providing moistness for sandhoppers. There is no systematic way that one can sample the whole beach, accounting for all the variation in different substrates of sand, shingle, pebble and rock, depending on the distance from the top of the beach downwards and encompass all the various bits of shelter material that can be found.

11. Sandhoppers away from the strandline

Sandhoppers move down the beach following the tide, especially after dark and before dawn. They may hide in burrows in the sand as the conditions dry out and may hop out when the tide flows again. They have periods of activity and feeding in the dusk and into the night when they do occupy extensive areas of beach. This is especially true of warm summer nights. It is interesting that a transect of the strandline in November 2003 found that the numbers increased to the mid-point of the strandline but up to 1m away sandhopper populations declined to zero and a search up and down the beach beyond the strandline did not reveal any more sandhoppers. An empty beach with no members of the public is ideal for sandhoppers but the peaceful place may be just fine for people to have a party, bonfire or barbecue, especially using the stranded tree trunks or great baulks of timber sometimes seen. Hazel's work showed the stark reality that where the strandline was cleaned away there were no sandhoppers, even away from the strandline.

12. Population increase

Hazel studied the strandline from April to early July, taking samples every fortnight just after the spring tides. She found an increase in numbers as the weeks progressed but sadly, due to the rules for presenting work in the academic year, she had to finish sampling before the late summer population abundance. My surveys overlapped with hers in June and July. There was a very good correlation between the populations in the two surveys over those three weeks. Graph 1 also suggests that populations peak in mid August, and have reached very low levels by the year's end.



Graph 2. Juvenile proportion of population of Sandhoppers

13. Variation in strandline condition

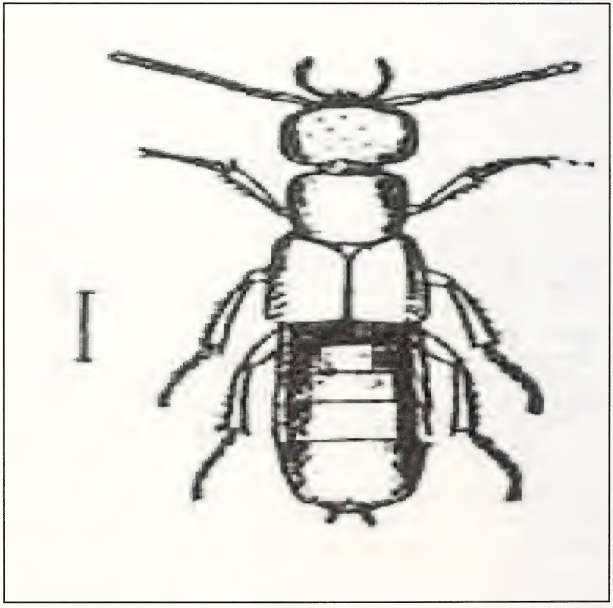
Decaying seaweed varies in both its wetness and heat, and different sorts of invertebrates react to the precise condition it is in. Earlier in the year, wherever the seaweed had become humic, there were large numbers of fly larvae. Such conditions were most likely to be found against the limestone cliff in the rocky southern section. Here the material was damper for much longer in each tide and it was shaded by the east-west alignment of the cliff and the overhanging trees.

Where the cliff did not shorten the beach the waves rolled on much further, but also ebbed further and more rapidly, creating a generally drier strandline. Because the equinoctial spring tides in March and September have the greatest range they allow more desiccation between successive tides but the solstice spring tides in June and December are much lower, more like neap tides and these allow better retention of moisture. In high summer the temperatures both assisting dehydration and promote decay so there is more likelihood of seaweed becoming humic. There are thus many changes in the nature of the seaweed throughout the year and every variation can be significant for the different invertebrate species.

14. Other inhabitants of the strandline

There are almost always other types of invertebrate collected along with the amphipods. Rove beetles, fearsome predators with short elytra belonging to three or four species, are often abundant, as well as herbivorous beetles. Fly larvae are also often very abundant, feeding on rotting seaweed. Adult flies

are regular but not abundant in collections. These make up the bulk of other invertebrates but there are also the occasional predatory centipede and millipede, other beetles and flies, and sometimes springtails. Occasionally ground beetles, scarabs, carrion beetles, ladybirds and click beetles make an appearance but the method is not fine-tuned to find these in any significant manner. Fine-tuning to do this would require methods specific to finding such creatures; carrying out 24 hour surveys along specific lengths of beach in the appropriate season for particular species; putting out bait; using light-traps; setting up pitfall traps. The reader will forgive us for not doing these other things since the objective is to sample amphipods. The incidental by-catch of certain other creatures that may have some significance in terms of the inter-actions of detritivores, herbivores and predators, putting amphipods into a context. There were in my surveys two possible examples of the predation of a sandhopper by a fly larva but it was not possible to show if the "predator" had caught and killed its prey or whether it was eating carrion. Occasionally, I found signs of predation within the samples such as detached limbs or partially eaten corpses.



15. Birds of the strandline

I am indebted to Mr David Derham of Worle for his bird diary and the careful notes of bird abundance associated with the strandline. His data for 2004 shows that the level of avian biomass is pretty constant through the year, though it drops sharply in August because of human disturbance. Gulls and corvids form some 75% of the biomass, and hence will consume a similar proportion of the available food. They are omnivores, looking for carrion and waste food on the strandline, but are unlikely to be a serious threat to the sandhoppers, as they are ill equipped to capture prey that moves so fast. There are flocks of finches especially during the winter that scour the beach for seeds that are floated off saltmarsh on the highest tides, and then concentrated on the strandline. The only species present in any numbers and likely to prey on the sandhoppers are Pied Wagtails and Meadow Pipits. They are always present from October to April, as large numbers of both species travel south from Scotland to over-winter in our region. They are almost entirely insectivorous, and because the strandline provides a constant source of invertebrates, even when the land is snowbound, it is a crucial resource for them. Despite the fact that sandhopper numbers clearly fall rapidly from November onwards, it is probable that sufficient remain to provide these birds with an adequate diet.

17. Results

Clean seas and safe beaches are important, and there is growing pressure on local authorities to achieve certain standards, and obtain their Blue Flag status. But beaches are also very significant wildlife sites, and play an important role in the complex relationship of land and water as sea levels constantly alter and floods of saltwater threaten. This study has shown that it is possible to maintain a high standard of cleanliness without wrecking the complex strandline community.

Phenology 2004

R.L. Bland
11 Percival RD BSA8 3LN Richardbland@blueyonder.co.uk

All these phenology records are based on a weekly 2km walk across Clifton Down, during which I note all species in flower, and such events as bud burst, first full leaf and so on. Dates are given as Julian days, that is days since January 1st. There is some tendency for events to be recorded earlier each year because I am more aware of what to look for. Another source of error is that many events are not easy to define. An open flower showing its stamens is reasonably obvious, but bud break is less so. To have a single individual making these value judgements each year at least cuts down some error. A further problem is that the actual date on which I do the walk differs from year to year because it is normally, weather permitting, done on a Sunday. Thus the date for an event being identified can vary with the date of the walk. A more familiar source of error is that individual specimens of trees and plants react in different ways to the stimuli they receive.

This year I have concentrated my analysis on plant events, though of course the first sighting of insects, migratory birds or early bird song are all influenced by weather, but also in part by day length. Furthermore there are chance factors associated with sighting them, whereas plants at least are static.

The spring weather in 2004 was for the most part normal. There was however an unusually warm spell in the first two weeks of February, but this was followed by temperatures that were close to average. Spring events followed a similar pattern. At the start of the year they were around a week earlier than the average since 1997, and then in early February the warmth brought a series of events up to two weeks early, By March timings were back to normal, and subsequent events were if anything two or three days later than average.

Measured by 26 events that are both obvious, and for which I have records back to 1997, the average date of spring events in 2004 was day 85 (March 26th), a day earlier than 2003, but two days later than the average. Chart 1 illustrates this pattern based on the events listed in Table 1.

	2000	2001	2002	2003	2004	Avg	STD
Hazel Catkins	12	19	20	19	10	16	4.1
Prunus cerasifera F	36	7	26	46	32	29	13.0
Celandine	45	11	39	46	32	35	12.8
Prusus pissardii F	40	34	42	29	36	36	4.6
Daffodil F	48	36	43	46	40	43	4.3
Almond F	47	55	52	66	39	52	8.9
Hawthorn bb	47		48	75	46	54	12.1
Wallflower F	56	84	34	69	82	65	18.5
Alexanders F	63	84	48	69	82	69	13.2
Blackthorn F	50	91	69	75	67	70	13.2
Ash F	70	84	76	74	82	77	5.2
Laurel F	72	92	82	96	88	86	8.4
Lime bb	90	97	95	89	89	92	3.3
Whitebeam bb	98	96	83	96	95	94	5.4
Bay F	91	107	89	96	102	97	6.7
Beech bb	102	112	97	104	88	101	7.9
Cow Parsley F	86	108	97	110	102	101	8.6
Lilac F	106	116	88	97	110	103	9.9
Horse Chestnut F	111	112	97	103	112	107	6.0
Hawthorn F	99	115	97	110	115	107	7.8
Garlic Mustard F	111	108	103	110	108	108	2.8
Wayfaring Tree F	119	121	103	96	108	109	9.5
Ox-eye Daisy F	121	133	124	116	129	125	6.0
Elder F	136	147	138	116	122	132	11.2
Dog Rose F	139	149	139	145	143	143	3.8
Bramble F		154	139	138	143	144	6.3
Average	80	91	80	86	85	84	4.2
Temp C	11	10.2	11.1	11.3	10.9	11.1	

Table 1 Dates in Julian days of 26 spring events 2000-2004, with average and standard deviation. Temperature is the mean monthly maximum for December to May

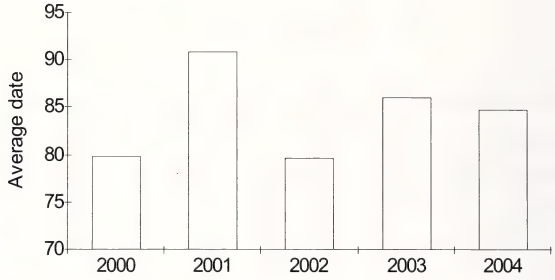


Chart 1. Average date of 26 spring events, 2000-2004

Examining the records since 1997 it is clear that the events that have the widest deviation from average are those at the start of the year. Chart 2 illustrates this by showing for 26 events the standard variation set against the average date of the event. Some species are inevitably far more affected by temperature change than others, who may have a long process to go through before they can come into flower. Species with bulbs and corms storing food such as Celandine or Snowdrop, can obviously react much more rapidly than species that have to build up their flowering spikes from scratch, such as Wallflower or Cow Parsley.

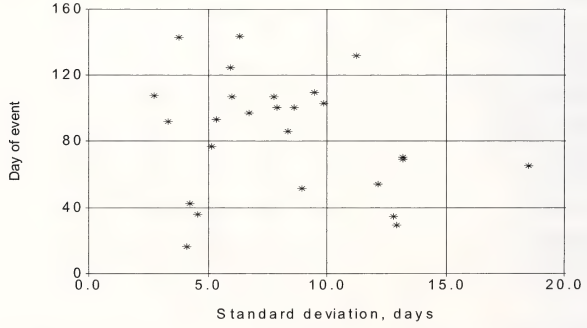


Chart 2 Relationship between standard deviation of events and the average date that they occur.

Some species are remarkably consistent in their timing, whatever the weather conditions. Garlic Mustard has come into flower between day 103 and 111, and bud break in Lime has occurred between day 89 and 97. On the other hand Celandine first flower dates range between day 11 and day 68, and are clearly very sensitive to temperature, probably especially that in December. Wild Wallflowers on the Downs show a similar huge variation between day 37 and day 84. There is still much to be discovered about the complex links between plants and the weather.

Gilbert White began the study of Phenology (he called it Nature's Calendar) in the 18th century and it is interesting to note the range of dates that he quotes for some events. His records extended over at least twenty years and were for Selbourne which is in North Hampshire, so it is unsurprising if his ranges are later and wider than those I have collected here over the past eight years. He gives ranges for nine events for which I have a direct comparison. On average these events occurred a full four weeks later for him, and the average overlap between the ranges is only a week. That means that his earliest dates are on average just a week before the Bristol a latest dates. For one or two species his earliest event is later than our latest. That is also true for records from Marlborough College for 1843-1863.
Hawthorn now flowers here a full four weeks earlier than it did at Marlborough, and Bramble flowers here seven weeks earlier. The average of 14 species shows that Bristol events are 18 days earlier than they were at Marlborough.

The mean maximum temperature of December to May for the past seven years was 11.3C, whereas the long term average since 1920 is 10.4C. Every recent year was warmer than average except for 2001 which averaged 10.2 because of a very cold March. The relationship between annual average temperature and the average date of spring events is shown in Chart 3. It demonstrates very roughly that a one degree change in average temperature causes a five day change in the average date of the events listed. The implication is that Bristol's average winter temperature today is three degrees warmer than Marlborough's was 140 years ago, and almost six degrees warmer than Selbourne 250 years ago.

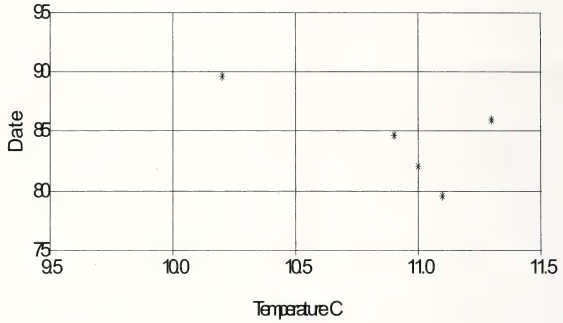


Chart 3 Relationship between mean maximum temperature December to May, 2000-2004 and average date of 26 events

The coldest Bristol spring (December to May) since 1920 was 1962-3 which averaged 7.6C, and the warmest 1943 which averaged 12.2C. Chart 4 shows the ten year rolling average spring temperatures since 1920. It illustrates the recent recovery from the thirty year cold spell from 1965.

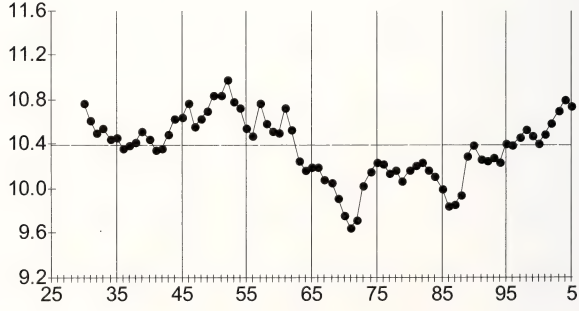


Chart 4 Rolling ten year average Mean maximum Dec-May temperature, 1920-2005 and, dotted, the overall average.

Autumn events.

The variation in autumnal events is as interesting as those of Spring, but less attention has been paid to it in the past. Events such as fruit ripening, leaves turning colour and trees becoming bare are controlled by a complex of factors.

The first fruit to ripen are Cherries and Mespil in early June. The average date of ripening of 30 species in 2004 was on three days earlier than the average of the past three years, but two days later than 2003 which had an exceptionally hot summer.

Whitebeam are generally the first trees to lose all their leaves in early October. By early November eleven tree species were bare, and by early December only Ginko, Turkey Oak and Sessile Oak had leaves left. 25 species were on average four days earlier than normal becoming bare, but one day later than 2003. Often a storm will remove the leaves from a series of species in one night, but it is valuable to get an understanding of what is normal.

The total time between bud break and leaf fall is a measure of the active life of a tree. Species that are well attuned to the climate would be expected to have a long active period, and those that need a hotter summer will have a shorter active period. Gleditsia from N American and Ailanthus from China both had short active lives of around 170 days, and Ash and Whitebeam were 190 days. Oak was 218 days, Horse Chestnut, which originates in Turkey, was 237 days in length, Hawthorn 252, and Elm 273. Elder scarcely loses its leaves before the new ones sprout, and it was measured at 329 days. Some of these figures were very different from the average, based on the previous two years and further records are needed.

Table 2 gives a list of the dates of eleven autumn events since 2001 in Julian days. October 1 is day 274. The average was, surprisingly, one day earlier than 2003.

	2001	2002	2003	2004
Blackberry ripe	188	202	201	200
Elderberry ripe	217	223	215	214
Yew berry ripe	240	230	222	234
Ivy flower	243	244	243	227
Gorse flower	266	251	256	234
Lime bare	321	300	285	298
Ash bare	314	300	292	298
Beech bare	328	300	312	312
Last wasp	327	318	319	319
Oak bare	342	348	320	326
Ivy ripe	335	328	342	333
Average	284	276	273	272

Table 2 Autumn events 2001-2004

Survival

Many flowering species of plants continue to flower up to the end of the year and beyond. Their survival depends upon their own toughness, the number of frosts, and the temperature and light available. Plants, including grass, will continue to grow down to a temperature of 5C, though as days shorten the time available when light energy is available reduces rapidly. Species such as Daisy, Dandelion and Shepherds Purse seem to be imperishable, but an extended period of low temperature would end their flowering. Provided day temperatures are above 5C many species can continue to function. Around 50 different species were found in flower within Bristol during December 2004. The results of an annual count of the number of species still in flower on Dec 31 is shown in Table 3. Three spring species were already in flower in 2004, Alexanders, Celandine and Barren Strawberry. This was the warmest December since 2000, and it is probable that in that year some species were missed.

	2000	2001	2002	2003	2004
Adria Bellflower	y	y	y	y	y
Alexanders					y
Barren Strawberry					y
Blackberry			y		y
Celandine					y
Daisy	y	y	y	y	y
Dandelion		y		y	y
Gorse	y	y	y	y	y
Groundsel	y	y	y	y	
Herb Robert	y				
Hogweed			y		
Ivy	y		y	y	
Ivy-leaved Toadflax	y	y	y	y	y
Oxford Ragwort		y			
Ragwort					y
Red Nettle		y			
Red Valerian		y	y	y	y
Shepherds Purse				y	y
Smooth Sowthistle		y	y	y	y
Snapdragon					y
Trailing Bellflower		y	y	y	y
Wallflower		y			
Yarrow				y	y
Yellow Fumitory	y	y	y	y	y
Total	8	13	12	13	17
December C	9.1	6.4	8	8	8.5

Table 3. Species in flower on December 31st on Clifton Down

The Avon Biodiversity Action Plan

Variety - the spice of life

Jenny Hayward

(Since this article was written Jenny has regrettably left the Avon Wildlife Trust to travel the world. Any correspondence should be direct to R Sharp at the Trust, rachelsharp@avonwildlifetrust.org.uk).

Biological diversity – 'biodiversity' – is the variety of life on earth. Practically all life forms are mutually inter-dependent. Higher life forms, and especially humans, could not exist without the complex variety of other living creatures. Biological resources feed and clothe us and provide housing, medicines and spiritual nourishment. The beauty of our surroundings depends in a large part upon their diversity. Imagine the poverty of a sea without fish, a wildflower meadow without bees busy pollinating it or Wordsworth's world without its 'host of golden daffodils'.

2004 saw the launch of a Biodiversity Action Plan (BAP) for Avon, the first over-arching nature conservation strategy for the former county. The Avon BAP was developed with the help and involvement of a wide range of local experts and organisations, including the Bristol Naturalists' Society, in order to make it as comprehensive, accurate, forward thinking and widely supported as possible. The three main aims of the plan are to:

1 Focus action on habitats and species that are of particular value in Avon, within the national context .
2 Encourage a common approach to biodiversity conservation and sharing of best-practice.
3 Encourage education and community action as an integral part of the biodiversity process .

The launch event was hosted by Bristol Zoo Gardens on a beautifully sunny day in summer. Guests including the Lord Mayor, local councillors and businesses joined the Avon Wildlife Trust and Avon Biodiversity Partnership members to celebrate the launch. Talks were given by Dr Jo Gipps, Director of Bristol Zoo, Chris Klee of Bristol Water, Les Davies of the Mendip Hills Area of Outstanding Natural Beauty and Philippa Forrester, a rising star in Natural History film making.

What's included in the plan?

Ecologically, Avon is exceptionally diverse for its size. Its varied geology results in the occurrence of a wide range of habitats, from the species-rich calcareous grasslands of the Cotswold and Mendip Hills and the ancient woodlands of the ridges, steep slopes and scarp faces, to the network of

rhynes of the Levels and Moors and the coastal saltmarshes of the Severn Estuary. Avon also supports a large number of nationally vulnerable species.

Objectives, targets and actions for many of Avon's most important habitats and species are set out in specific habitat and species action plans within the Avon BAP. These are: species-rich grassland and heath; hedgerows; arable farmland; purple moor-grass and rush pasture; woodland; wood pasture, parkland and veteran trees; standing open water; reedbeds and sedgebeds; watercourses and floodplain; coastal and floodplain grazing marsh; estuary; dormouse and water vole. Species action plans are only included for those species whose needs include more than simply looking after the habitats that they rely on.

Ten cross-cutting themes that affect more than one habitat or species and are addressed in the BAP: farming and private ownership; development and planning; water and wetlands; other environmental interests; invasive and non-native species; information and data; landscape-scale conservation; communications; recreational activity and funding.

A flourishing partnership

The Avon Biodiversity Partnership came into being in 2000 with the formation of the steering group, chaired by English Nature. It now encompasses a wide range of statutory and non-statutory bodies. The BAP is aimed at all those organisations, groups and individuals wishing to improve biodiversity in the area and particularly at partnership and potential new partnership members. There is an incredible amount of energy going into preserving and enhancing wildlife in the region. The plan and partnership aim to focus this energy on common goals in order to harness its full potential.

Putting the plan into action

Really making a difference for biodiversity in Avon is a far bigger, and more exciting, challenge than producing and launching the Avon BAP. Working together, the partnership members will drive implementation of the Avon Biodiversity Action Plan, pursuing, influencing and communicating biodiversity objectives in the area consistently.

One of the most valuable outcomes of developing the plan was bringing people together, making others aware of current activities and ideas for future collaborative projects. An essential part of the plan's implementation is to build upon this contact. Themed partnership sub-groups meet twice a year to co-ordinate, share information on and drive implementation of various aspects of the BAP. Chairs for these groups have been found from relevant organisations in the partnership. Thus the Agriculture group is chaired by DEFRA; the Water and Wetlands group by the Environment

Agency; the Woodland group by the Forestry Commission; the Coastal and Marine group by Avon Wildlife Trust; and the Communications group by Bristol Zoo Gardens.

We have already achieved a good deal. Many of you may have been involved in a fortnight of hedgerow activities co-ordinated by the Partnership and the Field Boundaries Project. The fortnight was fantastic with a grand total of over 1000 people getting involved. Thanks to anyone who came along to help, and particularly to Richard Bland and Terry Smith for organising great, and very well attended, hedgerow walks. We hope to repeat this fortnight in future, perhaps linking in with hedgerow weeks in Somerset and Devon.

The Avon Biodiversity Partnership has recently been made a member of the West of England Partnership – a new body concerned with sub-regional spatial planning in Avon. We hope to be able to strongly represent biodiversity in this process.
The implementation groups have met twice and considered where we can do more within existing resources and where new resources must be brought in and new projects developed to achieve our aims. The Agriculture group is currently developing and seeking funding for a grassland project and the Water and Wetlands group a pond project. The Woodland group is working on collating baseline data with regards management of Avon's woodland and also whereabouts of veteran trees. The Coastal and Marine group is focusing on an awareness-raising week of events in August 2005 and a leaflet highlighting our wonderful coastline and the parts that can be visited without causing disturbance.

How amateur naturalists can help
Without enthusiasts out there very little would happen at all. Amateur naturalists are often the expert in their particular field, be that the wildlife of their garden, a favourite species, nature reserve, walk or a whole taxa. It is vital that knowledge is shared, in order to help make sure we can all work together to preserve and enhance biodiversity for the future. In this way, amateur naturalists help to form the eyes and ears of the partnership alerting everyone to the presence of great crested newts in the local pond, bats in the belfry or veteran trees in the churchyard. One of the best ways to do this is to submit records to the Bristol Regional Environmental Records Centre, and to participate in monitoring surveys.
For more detailed information visit the website at www.avon-biodiversity.org.uk or contact Rachel Sharp, Avon Biodiversity Partnership co-ordinator, at the Avon Wildlife Trust (phone: 0117 9177270; email: rachelsharp@avonwildlifetrust.org.uk).

Intertidal warm springs of the Avon gorge

William Stanton
wis@kcwestby.fsnet.co.uk

In 1991 I persuaded my employer, the National Rivers Authority (NRA), that too little was known about possible warm springs in the Avon Gorge. The history of the Hotwells spring is recorded in *Hot Springs of Bath* (1991, G A Kellaway ed.), and four other supposed thermal sources nearby are briefly mentioned.

A preliminary skirmish with the estuarine mud below the Suspension Bridge on 17th August 1992 convinced me that sampling by boat was the only practical approach. On 22nd October 1992 we came up the river from Avonmouth at low tide in two inflatables (the first one scanning for sharp objects) and identified eight water flows arising through the mud from the Carboniferous Limestone bed, five on the west bank and three on the east. Of the six springs sampled, five were significantly above normal groundwater temperature (10°C to 11°C. The river temperature was 8.5°C on that day). Hotwells Spring was 22.5°C. The next warmest was St Vincent's Spring at 15.8°C.

For the record, working upstream:
Spring 1 (ST 557.746) is really a group of small springs on the west bank, straddling the contact between Lower Limestone Shales and Black Rock Limestone, about 6 metres above low water level (LWL). It was not sampled on 22.10.92.
Spring 2 (ST 5603.7445) is on the west bank about 1 metre above LWL, in Black Rock Limestone. On 22.10.92 the flow was slightly turbid (muddy), c. 4 lps (litres per second), and the temperature was 10.8°C.
Spring 3 (Saint Vincent's Spring, ST 5620.7407) is on the east bank about 2 metres above LWL, in Clifton Down Limestone. On 22.10.92 the flow was clear, c. 1.5 lps and, at 15.8°C, well above normal groundwater temperature.
Spring 4 was not sampled. It is on the east bank 400 metres downstream of the Suspension Bridge, and emerges from under the Portway and may be drainage from an old tunnel. The water was clear on 22.10.92.
The remaining 4 springs form a group rising from Hotwells Limestone in a 250 metre long stretch of river just upstream of the Suspension Bridge. All are warmer than normal groundwater.
Spring 5 (ST 5645.7303) is on the west bank 1 metre above LWL. On 22.10.92 the flow was slightly turbid, about 6 lps, at 13°C.
Spring 6 (Scarlet Spring, ST 5646.7291) flows from a masonry arch under the railway on the west bank, about 6 metres above LWL. On 22.10.92 the flow was clear, about 6 lps, and the temperature was 12.9°C. In 1841 the

Merchant Venturers' Society proposed to pipe the water from this spring, "Scarlet Well", to the city, but the scheme fell through. It is recorded (BNS Proceedings 1898 page 172) as failing in dry summers between 1887 and 1893, perhaps because nearby springs 5 and 8, at lower levels, are able to capture reduced flows. (During the six years 1888-93 there were five dry years, averaging 750mm a year, the same as 1976, and one wet year)
Spring 7 is the Hotwells Spring (ST 5652.7288), on the east bank about 4 metres above LWL. On 22.10.92 the flow was clear, about 1.5 lps, at 22.5°C.
Spring 8 (ST 5650.7281) is on the west bank about 2 metres above LWL. On 22.10.92 the flow was turbid, about 2 lps, at 14°C.

Water analyses showed high levels of sulphate, typical of the Bath Hot Springs, in springs 3 and 7 (the warmest). Iron and manganese levels were relatively high in springs 2 and 8. Sodium and chloride levels exceed normal groundwater values in almost every case. All the figures are imprecise, however, because water chemistry and temperature are affected by an unusual phenomenon, as follows.

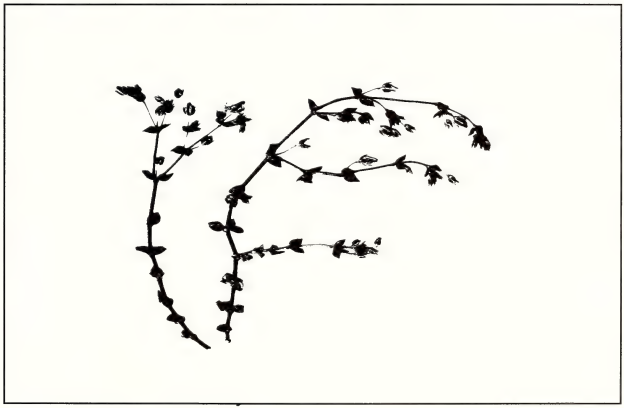
When the tide is out, the springs drain freely. As the tide comes in and submerges the springs, the pressure head reverses and tidal water, muddy and saline to varying degrees, is forced into the springs and along the underground channels behind them. The natural spring water is pushed back and mixes with the invading estuary water. Then, when the tide ebbs and the springs are uncovered, the mixed waters pour forth. Initially they are turbid and saline, but the natural spring water soon begins to dominate. The outflow diminishes, as does the turbidity, and the chemistry and temperature move towards their true values. The higher the spring above LWL, the shorter the time available for estuary water intrusion, so the more likely it is that genuine analyses and temperatures can be measured before the next high tide.

Falling spring output was actually measured by current-meter gauging at Spring 6 on 17.8.92, when the flow was 35 lps at 3.10 pm and 30 lps at 4.15 pm, and the turbidity was visibly reducing, as river level dropped steadily. Possibly, at periods of neap tides, genuine water analyses and temperatures could be obtained at some of the springs. The NRA investigations were abandoned before this could be attempted.

What is the source of the warm water? The Bath hot springs (normal flow 15 lps at 41°C to 47°C) are generally believed to be water that fell as rain on the Mendip Hills centuries or even millennia ago. Driven by the pressure of the high water table in parts of the Mendip limestone outcrop, it follows a tortuous route through incipient caves in the complex Carboniferous

Limestone aquifer between the Mendips and Bath. To pass beneath impermeable strata of the Radstock Coalfield it has to reach a depth of around four kilometres, where it acquires its heat. (Alternative theories, easily refuted, are that the hot water originates in the Avon valley close to Bath, or even in the Forest of Dean.)

The Avon Gorge warm springs rise from the lowest outcrops of Carboniferous Limestone in the whole region, some 30 metres below the Bath springs level. Unlike the Bath springs, which are protected from mixing with local rainfall by an impermeable cover of Lias clay, the Avon Gorge springs catchment must include significant areas of the Downs and beyond Leigh Woods. Their thermal component, rising from great depth, will be diluted and cooled to varying degrees. The hot water must have reached a depth of several kilometres at some point in its underground travel. The most likely explanation is that it is Mendip water that was on its way to the Bath hot springs when it was diverted, beneath the Radstock coalfield, to the lower-level Avon Gorge springs, by the normal processes of underground water capture. No other origin would force the circulating water to such a great depth.



Narroways Local nature Reserve

H McPhillimy
Harrymacp1@yahoo.co.uk

In the eighties I gardened with disabled adults In St Werburgh's City Farm in inner city Bristol. Narroways Hill with its woods and railways was our backdrop. On impulse I went up there one hot July afternoon through the broken fence and found a lost place of flowery butterfly meadows, abandoned damson trees and rapidly seeding ash trees. Here wildlife was quietly getting the upper hands and over the years it has come to feel like my country estate in the city.

When the railways were built here in the last century they left ugly scares in the countryside as can be seen in Lavars 1880s picture of Bristol in the City museum. In 1891 the railway engineer Charle Richardson wrote " Passing through the Narroways Hill cutting the line crosses Boling Wells valley on a 50 ft embankment over a flat swampy ground made up of Lias slip-clay washed down there by the brook…..this ground evidently could not carry a heavy embankment.….I therefore, as a precautionary measure, had a wide trench cut down ten feet deep under the toe of each slope and the red marl from the adjoining Narroways Hill cutting the ran into these trenches to form a foundation." Over a hundred years of the city expansion combined with the restorative power of nature have turned the tables- now Narroways Junction is a natural sanctuary abutted by dense housing on all sides.

The present day ecology has arisen from a complex combination of climate, soil, the vegetation existing when the railways were built and the way the land has been managed since. Grass burning in the steam era, temporary allotments and orchards, a laisser-faire attitude that allowed scrub to develop into an ash and sycamore wood, and deliberate tree planting and habitat management of recent years have helped shape the environment.

Railway land has its own charming associations of plants an animals doe to the ease with which introduced plant species could spread along these green corridors. Rosebay Willowherb and Goldenrod seeds rode the train's slipstreams. The cutting where the soil was scraped back to marl bedrock slowly developed a community of slow growing lime loving plants characteristic of chalk downland such as Greater Knapweed, Field Scabius, and Birdsfoot Trefoil. These grasslands, with their wonderful butterfly populations, Common Blue, Small Copper and Marbled White amongst others, and healthy numbers of Slowworms and Common Lizards, are a rich and interesting habitat especially the hot south facing embankment slopes and cutting walls. There are rare species too; a great swathe of the scarce

Corky-fruited Water Dropwort in the field near St Werburgh's Church, Chicory, Field Garlic and Round-leaved Cranesbill and unusual moths such as *Sitochroa verticalis* and Six belted Clearwing. Many species especially insects remain to be discovered.

In its five acres there are also dense thickets of lacerating bramble and suckering fruit trees, patches of tall grasses often on the fertile site of abandoned allotments and a nicely developing ash woodland revealing a continuity with more ancient woods when this area was known as Ashley Vale. The old allotments now boast an undulating assembly of anthills. Ponds in neighbouring gardens help to sustain a rich amphibian life of Toads Frogs and Smooth Newts. Grass snakes lurk.

Birds and animals find the site congenial. Kestrels and Sparrowhawks hunt here. I once watched a Kestrel struggling to carry off a rat from the allotments while being mobbed by a pair of Magpies. Jays screech in the thickets, charms of Goldfinch settle on Teasels in winter when parties of Long-tailed Tits drift amongst the Hawthorns. Foxes, once common in Bristol, are still fighting to recover from the mange that decimated them ten years ago, but Grey Squirrels and Hedgehogs have a presence, and there is a local Badger sett. On July evenings screaming Swifts cutting low over the meadow merge at dusk with the flittering Pipistrelle Bats.

Narroways was threatened several times with development in recent years. To some it was a 'brown field' site, but not to the increasing numbers of local people who loved its wildness. On 21 February 1997 an astounding 800 people demonstrated on the hill and saved it as open space. It became a millennium green in 2000 with a 999 year lease. It is less of a secret place now, but on a June evening when the Chiffchaff sing their challenge and Marbled Whites emerge from the meadow flowers which glow against the textured shadows it is still very special.

Narroways is best approached from the path at the back of St Werburgh's Church, MR 600 749. It rises steeply to a bridge over the main line north, and there is then a wide expanse of grass and a steep sided cutting. The path continues to join Rousham Road at ST 603752. Further information about the reserve can be found via the link on Avon Wildlife Trust website www.avonwildlifetrust.org.uk

Turbulent tides in the Avon estuary

(extracted from the BNS Bulletin)

by W Stanton, RL Bland, M Hobbs & P Singer

This is a compilation, with minor editing, of a series of brief articles about tidal effects on the River Avon that appeared in the monthly bulletin during 2004.

WS, February 2004. A Boiling Avon

In 1991, studying the warm springs of the Avon Gorge for the National Rivers Authority, I was standing just upstream of the Suspension Bridge beside the old railway. The water level was high and rising fast, and the muddy water was 'boiling' in a myriad small turbulence cells across the full width of the river. Obviously the tide was coming in, and yet when I threw an apple core into the river below me -- it stayed in the same place! After about 20 minutes the water level had risen a foot, but the core had hardly moved, and then I had to go elsewhere.

It seems that when the tide comes in, a wedge of dense muddy salt water moves rapidly up the river from Avonmouth, burrowing under the less dense fresh water of the river. The turbulence occurs at the interface between salt water and fresh water. Maybe it only happens at particular states of the tide and places in the river.

RLB, March 2004: The turning tide

W Stanton's note above reminded me of a phenomenon that I have frequently noticed from the Peregrine Watch site on the Downs. It is easy from there to tell whether the tide is rising or falling, but at around high tide I often saw a line running from bank to bank. On occasion this was a line of flotsam and jetsam, at other times it appeared more as a difference in the light reflected from the water. It usually lay somewhere below the Suspension Bridge, but it also moved very slowly. While the tide was still rising it moved slowly upstream, and as the tide began to fall it moved slowly downstream. Once the falling tide got into its stride the feature vanished, and the debris was brushed to the side by the strength of the central current.

I interpreted this as the line where the water coming downstream met the tide coming upstream. There are clearly several factors at work, and no two tides will be the same. There is the actual volume of land water coming down, the height of the particular tide, itself affected by the volume of Severn fresh water, the strength and direction of the wind in the Bristol channel as well as the position of the moon. This will affect the salinity of the water coming up the Avon, and hence how far it sinks below the land water coming down, and how far it simply acts as a liquid dam checking the flow. There is thus both an actual flow, and an increase in height as a result

of pressure. At the highest tides water advances over the Netham dam (which is 33 feet above low water) and reaches right up to Hanham Weir. However the total absence of estuarine plant species above Netham dam illustrates the fact that the saline content of this water must be virtually nil - it is fresh water being pushed backwards. Plants typical of salt-marshes can be found all the way up to Netham dam, showing that, when the Severn flow is low, the water coming up the Avon is saline. The most upstream point where seaweed occurs is on the cliffs at Chapel Pill, just below the former Ham Green Hospital. (See MH, October, below).

RLB, September 2004: **The turning tide 2**
I happened to be at water level as the tide was on the turn in early August, and was able to watch the process in detail. The incoming tide was strongest in the centre of the river, while the outgoing water flooded down both edges. The fresh water was a different colour, muddier than the incoming water, and the line of junction, and debris, formed a huge V across the river, with water still moving upstream at the apex, and flowing strongly downstream at the sides. There was no boiling, and no height difference either side of the line, and the junction point moved very slowly downstream as the power of the ebb gained over that of the flood. Debris tended to be concentrated at the centre of the V as incoming debris, spread randomly across the river, was forced by the two ebbing arms to concentrate in the centre. There must be a point on every tide, in both time and space, at which the power of the flood fails, and the ebb takes full charge.

MH, October 2004: Seaweed and salinity
Seaweed grows even further upstream in the Avon than Chapel Pill. I have observed it on the sea wall at Sea Mills, immediately above the Trym estuary. Some seaweed grows on the south side of the Avon opposite Sea Walls and slightly more upstream on the north side on loose stones immediately below Sea Walls; however the growth here is patchy and probably marks the point where the water is not saline enough to encourage sustainable growth.

PS, November 2004: Salinity and density
With rising tide the water in the Avon reaches the level in Cumberland Basin and the lock gates are opened. Unexpectedly, the surface water in the lock starts to flow backwards towards Avonmouth. The tidal water in the Avon, carrying a lot of mud particles in suspension , and possibly saline, is denser than the upstream water. It flows into the lower depths of the lock and the displaced 'fresher' water flows back out over the top of the incoming tidal water. Furthermore, having left the lock the surface flow of 'fresher' water carries on towards Avonmouth against the tidal flow, taking with it floating debris.

To see this effect you need to be at the lock about an hour before a tide with a predicted height of at least 10 metres according to 'Bristol City Docks Cumberland Basin Tide Tables'. There is nothing dramatic to be seen, in fact you may need to throw a twig into the water to see what is happening.

Biodiversity Gets Active in South Gloucestershire

Alison Slade
Alison.Slade@southglos.gov.uk.

I recently joined South Gloucestershire Council as their Biodiversity Action Planning Officer (part-time, working part-time as the Ecologist for Bath and North East Somerset Council as well), based at Kingswood.

The Biodiversity Action Plan (BAP) for South Gloucestershire is to be drawn up over the next two years and will consist of a series of Action Plans. A strong partnership of organisations and individuals meets to advise on developing the BAP and actively carries out conservation work in the area. They have selected 20 species and habitats as BAP species, including barn owl, bullfinch, song thrush, ancient woodland and traditional meadows/pastures.

Each Action Plan will include a range of works and targets whereby the Council and its partners will help safeguard and/or extend populations or areas of these species and habitats. A Design Guide for developers called Biodiversity and the Planning Process is being published by the Council, which formalises the BAP.

Wildlife events in and around South Gloucestershire to increase knowledge and skills are also being promoted.

For more information or if members would like to become more involved contact me, Biodiversity Action Planning Officer Tel 01454 862215. Alison.Slade@southglos.gov.uk. Further information is posted on the South Gloucestershire Council website www.southglos.gov.uk

Bristol Botany 2004

C. Lovatt
clovatt@deloitte.co.mw

"Finality in field-botany is fortunately unattainable, for therein lies the charm of research: the keen anticipation of discovery lends zest to the pursuit, and stimulates each fresh generation of workers to outdo those that

have gone before". (J. W. White in 1898, in an article entitled "The botany of Bristol").

Introduction

The retirement of Professor Willis (my external examiner as an Undergraduate botanist in 1977; I still recall his probing questions concerning the physiology of bluebells) was announced in the BNS Bulletin in March 2004. It was with some surprise when, on an BNS field meeting at Poor's Allotment in September 2004, Mark and then Clare Kitchen asked if I might (if formally asked) consider taking over the compilation of the annual "Bristol Botany" report. Richard Bland has written in the 2003 *Proceedings* not only about Arthur Willis's huge contribution to Bristol Botany (39 annual reports) but also of the very few individuals who have been honoured to follow James W. White. He himself wrote of his delight in accepting the invitation from the BNS to compile a local flora, when in the late 1870's he arrived in Bristol "a stranger and a tyro". Of course, he was far from a novice and had in the previous decade already won a medal for his herbarium collection.

For my part, I came to Bristol in 1977 to study the flora and vegetation of the Avon Gorge for a PhD thesis and then and subsequently I have studied many of the books, manuscripts herbaria, associated with Bristol plants and botanists. In the meantime I "took up accountancy and emigrated to Africa". Though I return most years, (as White put it in 1918) "in active field-work the author's personal doings …count for little. This deficiency, however, is of no moment in the face of the energetic help…given by…loyal friends and correspondents...". Nowadays as well the speed of electronic communication and the extent of information available on the Internet and on CD can shorten the apparent distance. The "Millennium Map" (available as a county or regional CD under the brand name "High in the Sky") can be used to "see" the ground corresponding to a grid reference.

It is not intended to significantly change the style and content of Bristol Botany (hereafter "BB"), but at a distance it is particularly difficult to comment on the weather and the effect on the plants. Richard Bland's weather and phenology reports in these *Proceedings* (as well as his weekly letters on the BNS website) admirably fill the gap. Although the Flora of the Bristol Region, published in 2000, is the baseline account for most of the area covered in BB, it is not intended that these pages should be used as forum to add dots to the 1 km square maps. Hence grid references are not given here, though correspondents have almost always given them. The records submitted have been retained by the BNS, but the selection for publication has been my own. J.W. White's Flora of Bristol (1912) remains

an essential companion to anyone interested in the botany of the Bristol area. The New Atlas of the British and Irish Flora published in 2002 (referred to on CD) gives a broader and more considered view of the current 10 km square distribution of species. The Vice-County Census Catalogue published by the BSBI in 2003 also makes it easy to be reasonably sure if a plant is new to the Bristol area.

Here begins the formidable challenge, and I take it up in memory of my botanical mentor Adrian Grenfell, who did not live long enough to join me in writing it.

Bristol Botanists

It has always been the case that these pages have recorded the passing away of deceased botanists and where significant old records have emerged by chance finds or active research. I now propose to formalise and extend this area of "Bristol Botany" into a section of the annual report, to supplement the chapters in the 1912 and 2000 Bristol floras. These follow in alphabetical order and are (with one exception where I correct what seems to me to have been an omission) based on researches or events of 2004.

Elizabeth Emily Bell

In late 2004, the booksellers Maggs Brothers of London advertised for sale at £100 a herbarium book of 136 pages, which had belonged to Elizabeth Emily Bell of (or residing at) Bristol. The specimens were dated 1866 to 1870 and were mainly from Weston-super-Mare with some from a later visit to Ireland. Unfortunately it had been sold by the time I was able to enquire after it. David Allen draws my attention to a Miss? Elizabeth Bell of Berwickshire who died in 1876 but who seems to have been mainly a mycologist. I have notes of two female Bells collecting at Bristol. The Miss Bell who gathered specimens around 1840 at Bristol and Burnham which are in H C Watson's herbarium at Kew had an initial A and lived at a vicarage in Norfolk (D Allen, pers. comm.). Mrs Ethel M E Bell died in 1957 and her herbarium is at the University of Leicester. Evidently, eight male Bells are on record as collecting plants in Britain but none fit the place or date. We hope that the herbarium book or details of its contents may reappear in due course.

James Ebenezer Bicheno

As indicated in the Bristol Flora, a number of plants collected from the Bristol area were drawn in Sowerby's English Botany and Curtis's *Flora Londinensis*. A copy of the first edition of the latter is held by Bristol University. Sir W J Hooker expanded the work for the second edition, and it has a plate of *Hornungia petraea* (under the old name *Hutchinsia petraea*)

drawn from specimens collected on St Vincent's Rocks by Mr Bicheno. The Flora of Gloucestershire (1948) mentions a specimen of *Diplotaxis tenuifolia* from Clifton dated 1814 and the paper on my copy of the plate is watermarked 1821. A recently discovered portrait of James E Bicheno is reproduced in the April 2004 edition of BSBI News. His herbarium and annotated copy of Smith's *Flora Britannica* (1802) are at Swansea Museum and may include some records for a period in Bristol Botany when rather few have been preserved. The expanded *Flora Londinensis* also has an excellent plate of *Arabis scabra* (as *A stricta*, watermark 1831) if a little early to show the fully extended fruits. In this case unfortunately neither the collector nor any topographical details are included on the accompanying text.

Thomas Bruges Flower

In the Bristol Flora (pages 88-91), White gives a lively account of TB Flower and his sixty-year plus contribution to Bristol Botany. For many years, his herbarium, bequeathed on his death in 1899 to the Harper family of Bath, was assumed to have been lost. In 1984 it resurfaced in Plymouth Museum as described by David Allen in Watsonia 15, 269-270 (1985). In September 2004 I was at last able to inspect it. There is a catalogue prepared by a Miss C Valentine in or around 1992 together with a report and analysis and some interesting biographical details, including his will and a citation as "a gentleman much attached to the study of botany" for fellowship of the Linnean Society of London. The collection is also entered in the Museum database but neither is so complete or reliable that physical inspection is avoidable.

I am assembling materials on Flower for a more detailed account, but it can be noted here that the collection tallies in almost every detail with the specimens (or their absence) and their sites and dates of collection as noted in the species accounts in White's Flora. This indicates that he must have spent at least several days examining the same herbarium about a hundred years ago, after Flower's death, and that new data, at least in connection with the Bristol flora, will concern matters of detail or synthesis (for instance he collected on Steep Holm far more often than White suggested) rather than unpublished and more precise information on the localities of the less common plants. Flower was rightly notorious for vague or misleading descriptions of localities and the survival of rarities but his herbarium lacks the more precise details hoped for by Allen. I will report on some specimens in the species accounts that follow.

By chance, in the same Museum room as their respective herbaria, I found a manuscript account by the Plymouth botanist and printer, IWN Keys, of "a

little botanical chit chat" with Flower over several occasions in May 1853 (Keys' Botanical notes Vol 1). Flower exchanged two specimens from St Vincent's Rocks for fourteen from Plymouth, as the two discussed the declining state of the Botanical Society of London, the rare plants of Berry Head in Devon, the taxonomy of *Cochlearia* and the native or introduced status of *Coronopus didymus*. Flower mentioned having gathered *Eryngium campestre* at Weston super Mare, adding that "he feared it would be lost from that habitat, as the ground was being brought under cultivation". This adds a little to White's account (1912, p 330-331) of the plant's history there. The four Flower sheets collected (later) in September 1853 and in 1860 from "under a wall close to the wood at Weston-super-Mare" now seem to be missing.

George W Garlick

Mr Garlick's contributions to botany in Bristol have been briefly summarised on p.49 in the Flora of the Bristol Region but were not mentioned in these pages. He recorded the Avon Gorge for the first BSBI Atlas (published 1962), sensibly using three different cards for the area. He took an interest (independently of PJM Nethercott) in the whitebeams and in 1956 made some records for Leigh Woods based on EF Warburg's determinations.

Although he had more or less given up botany he had not moved house; when I made contact in 1979 he recalled with great pleasure the pleasant memories of those days. One rainy day we went to Leigh Woods where he tried to let 'George' (in this context the World War Two autopilot) find the exact hollow where he had discovered the Beech Fern (BB1952). According to PJM Nethercott (BB1977) it had probably already gone by then and we did not find it. Mr Garlick did however well recall Noel Sandwith's very physical excitement at the "remarkable find".
In 1979 he gave me his three "survey books" now "only [sic] of historical interest". In these he had recorded for some 350 survey areas the abundance of trees and shrubs, sedges, ferns, grasses and then other flowering plants and plants of ponds and ditches, alphabetically by latin name. Some 100 or so of the habitat study areas are in the Avon Gorge. I lent the books to the Bristol Regional Environmental Records Centre for a year and they should have made copies. I also was allowed to keep some of his (then) un-mounted duplicate specimens and have a black and white photograph of him in flat cap and waterproof jacket in the site of his botanical explorations of a quarter of a century earlier.

Colin Graham Trapnell

In Bristol Botany in 2003, Professor Willis drew attention to the death (on 9 February 2004) of Colin Trapnell (b.1907), who for many years had been the Colonial Government ecologist in what is now my neighbouring Zambia (not Zimbabwe) and later Kenya, before returning to Bristol in the early 1960's. There is a full obituary in the Times (20 February 2004), which describes him as a keen botanist since his schooldays at Sedburgh, and adds a typically colonial anecdote describing crowds of curious natives seeing a white man taking his evening relaxation in a copper bath!

Around 1980, I discovered his herbarium and botanical notebooks (1919-1926) at Clifton College and was able to persuade the College to transfer them to the Botany Department of Bristol University. Their current whereabouts need to be confirmed given the transfer of the University herbarium to the Bristol Museum about 10 years ago. They include notes on the Avon Gorge flora and no doubt (for I passed them over at the time) elsewhere. He is mentioned in Bristol Botany in 1923 when he and HS Thompson noted a particular form of Common Mouse-ear under Leigh Woods and in White's own annotated copy of his Bristol Flora when he recorded *Chara fragilis var. deliculata* on Walton Moor in 1925. When I entered into correspondence with Mr Trapnell he gave me a letter from JW White (dated around 1928) in which he thanked Trapnell for the offer of some Irish plants "to fill sheets you know" for his herbarium. With Trapnell's death (and I regret never having taken up the matter) our last personal botanical link with White (1846-1932) has gone.

His ecological survey of Zambia was published by Kew in 2001 and he founded a fellowship in African terrestrial ecology at the University of Oxford where he had studied Classical Greats. A photograph of Trapnell as a young man on Table Mountain, Cape Town is published at www.eci.ox.ac.uk/people/trapnell together with a more recent photo of him with the first Trapnell fellow, Dr Lindsey Gillson, who has fond recollections of his lively mind. By chance, I was able to purchase on the open market, three of his well used copies of African tree books (Kenya, Zambia and Uganda). The dealer confirmed that they had not received any old books of Bristol interest.

In Bristol Botany in 2003, two excellent records appear under the name B. Lancastle. B Lancaster was intended.

Bristol Botany Bibliography

Several publications relevant to Bristol Botany were made during the year.

The Interactive Flora of the British Isles (2004) brings British plant identification to the computer perhaps belying the old adage "take the book to the plant not the plant to the book". The disc reorganises the principal content of Stace's 1997 New Flora and the 2002 New Atlas, and adds some 8,500 photos and reproductions of drawings as a guide to identification. Many photos are from outside Britain and in this respect Bristolians have missed out on the opportunity to promote the local flora.

In Watsonia 25 part 2 for August 2004, pages 185-191, Tim Rich and Libby Houston survey the distribution and abundance of the endemic *Sorbus wilmottiana*. The article is accompanied by sample leaf outlines. They identified 42 trees and six possible saplings, mainly in and near Quarry 4 under Leigh Woods and in the Gully on the Clifton side. It is a distinct line with less than 11 veins, and narrowly incised rhomboidal leaves, white underneath. It seems to have come to the attention of the botanical world amongst the sheets of *S. aria var. incisa* distributed by J W White in 1922. The type tree is at the edge of Clifton Downs just north of the Great Quarry. It was felled to improve the view but subsequently recovered as described in BB 1969 and BB 1976 respectively. A similar paper on *S. bristoliensis* is understood to be in preparation.

The un-named trees at the north end of the Great Quarry floor, which have similar but stiffer and un-lobed leaves, are said to be different. These were previously reported by the same authors but without locality in BSBI News 75 page 69 in 1997 under the anticipatory title, "a new species of *Sorbus* from the Avon Gorge". I had (perhaps by received wisdom) always regarded them as an expression of the same thing in open conditions. In addition to using them as demonstration specimens I had collected and distributed reference material (2 October 1979, Kew, Bristol University, Bristol Museum and Hb. CML).

In the Botanical Journal of the Linnean Society for July 2004 a paper by Chris Preston, David Pearman and A R Hall, "Archaeophytes in Britain" is likely to prove influential by inspiring new insights into the status of plants and plant communities at the national and local level. The term was introduced to many British botanists in the New Atlas of 2002 (though the records are mapped as Natives and Aliens) and the BSBI vice county census catalogue of 2003.

Native plants arise in a study area (e.g. the British Isles, the Bristol Region or a smaller area such as the Avon Gorge) have arrived naturally (without the influence of man) from a native site. Aliens (often called adventives) may be casual or naturalised. Amongst naturalised plants some can be

shown to be of recent arrival (neophytes); some seem to be of ancient (nominally pre AD 1500) establishment such that they "look wild" and have often been regarded as native. These are the archeophytes. Many are cornfield or wayside weeds for which archaeological evidence of native status is lacking, and several of the "pot herbs" of St Vincent's Rocks are unsurprisingly included there. JW White (Flora of Bristol 1912, pages 330-331) would probably still regard *Eryngium campestre* as a (former) native at Weston -super-Mare.

In these pages natives and aliens have always been separated but some novel allocations may now be called for. Pending a full review of the status of the wild plants of the Bristol area, I have included as aliens plant records of plants that may be native elsewhere in Britain, or even in the Bristol Region, but which here are clearly adventive in the places reported here. For example, records of *Aquilegia vulgaris* L., Columbine, that are of garden plants often in waste places are listed under aliens. For records where the status in uncertain, the records are listed as natives. H C Watson, whose lifelong interest was the distribution of native plants in Britain, caustically suggested that records of the distribution of alien plants have the "topographical value of a tomato on a dunghill".

In BSBI News for September 2004 (issue 97: pages 15-19) there is a table showing the species richness of the 113 British vice counties. The Bristol area includes part of two vice counties and has always been reputed as one of the richest botanical areas in Britain. W Gloucestershire is ranked fifth with 2,158 taxa as there defined, of which 953 were alien. N Somerset is sixth with 2,149 (951 alien). White's Flora of Bristol included 1,692 plants, reckoning 981 as native and 1,178 to be permanent members of the flora. The Flora of the Bristol Region claims over 1,600 species.

Geographical coverage

EH Swete used a five-mile radius when defining his area of study in the Flora Bristoliensis (1854). In 1864, soon after formation in 1862, the Bristol Naturalists decided to extend this to a nine-mile radius; the botanical section at least, started recording plants on a square mile basis. The herbarium put together by the Reverend WW Spicer and presented to the Society in 1868 (when it was said to have 411 sheets) is now incorporated in the general collection at Bristol Museum and shows Avonmouth as square 52, Abbot's Leigh as square 109 and Durdham Down as square 110 (I have a full account on this innovative recording scheme in preparation).

Already by then the Society had elected to use the 1862 Sanders geological map of "The Bristol Coal Field and Country Adjacent". This explains the

title of White's earlier Flora (issued in parts in these Proceedings from 1881 to 1887) and the subtitle of his monumental Flora of Bristol (1912). White describes the area in the first pages of his Flora as an irregular right angled triangle of 720 square miles from Dursley in the north southwards to the east of Bath to Frome, and thence west to the Severn at Huntspill, south of Burnham. North of Bristol, Avonmouth and the hinterland of Bath, the area falls into the Watsonian vice-county 34, West Gloucestershire, conventionally abbreviated "G". The southern area lies in vice county 6, North Somerset ("S").

This area, arbitrary and artificial as it may be, still delimits the geographical coverage of Bristol Botany. It is slightly larger than the former administrative county of Avon as dealt with in the Flora of the Bristol Region (2000), which included about 1,500 whole or part kilometre squares. Compared to the traditional Bristol Naturalists' area, Avon was slightly truncated at the northern end and omitted a strip of White's triangle some 10 miles or so south from Brean Down. That area was covered in the recent Somerset Atlas (1997).

The Gloucestershire Flora (1948) covered the whole Watsonian county south to Bristol; Murray's and Roe's Somerset Floras did the same for that county, reaching north to Bristol and Bath. Any duplication of effort in the field has tended to improve the extent of recording, but such recording has been far more consistently undertaken based on Bristol than on Gloucestershire or Somerset.
Names of the contributors of plant records are abbreviated thus:
JA J Aldridge. RLB R L Bland. RSC R S Cropper. PH P Hilton. BL B Lancaster. CML CM Lovatt. PM SP Millman.

Equisetum sylvaticum, L. **Wood Horsetail** Still thriving at Compton Dando, S, where first found in 1985 at its only site in the Bristol Region, over 100 stems counted. S. R SC.
Polypodium vulgare L. **Polypody** On acid soil below the Towpath under Leigh Woods, S, CML. The Avon Gorge has all three polypody species.
Dryopteris carthusiana, (Vill.) H.P.Fuchs. **Narrow Buckler-fern** Weston Moor, where last noted in 1985 according to the Flora of the Bristol Region. PM.
Nymphaea alba, L. **White Water-lily** With *Nuphar lutea*, Yellow Water-lily in Abbots Pool, Abbots, Leigh, S. RLB.
Ceratophyllum demersum, L. **Rigid Hornwort**, Pond, Brockley Combe, S; also *Nymphaea, alba*, **White Water-lily**. S, RLB.
Helleborus foetidus L. **Stinking Hellebore** A roadside throw-out at Abbot's Leigh, S, and by a path in Stoke Bishop, G, both RLB. I have

specimens gathered around 1980 in Leigh Woods, S, close to the Suspension Bridge. Bob Russell, the Warden, pointed out the plants. Their status there is uncertain.

Ranunculus trichophyllus, Chaix **Three-leaved Water-crowfoot**, Not seen from 2000-2003 but in 2004 it was spreading well along the banks of two rhynes on Clapton Moor, S, PM.

Aquilegia vulgaris, Columbine, Eight square kilometre records supplied by RLB as additional to the Flora of the Bristol Region (which has 140 records), but all refer to garden plants on road verges.

Thalictrum flavum, L. **Common Meadow-rue**. In BB 1995 (and also according to the map in the Flora of the Bristol Region) it was suggested that this plant might have been lost under Leigh Woods. I have known it beside the Towpath opposite Bridge Valley Road since 1978 and although from time to time it is overgrown, it survives and may often be seen in flower. GW Garlick knew the same colony in about 1950 and also noted it beside the river north of Quarry 2, where it may not have persisted.

Papaver rhoeas L., **Common Poppy**, RLB has added 38 new records to the 554 mapped in the Flora of the Bristol Region.

Soleirolia soleirolii, (Req.) Dandy **Mind-your-own-business**, On a wall at Cold Ashton, G; *Solidago gigantea* Aiton, **Early Goldenrod** and *Spiraea salicifolia* L., **Bridewort** nearby, G. RLB.

Quercus rubra L. , **Red Oak** Regenerating at Failand, S, west of Abbots Leigh, RLB.

Carpinus betulus, L. **Hornbeam** Planted ina hedge at Heron's Green, Chew valley Lake. S, RLB.

Chenopodium polyspermum, L. **Many-seeded Goosefoot**, A small patch in a bare area in a field on the outskirts of Portishead., S, RSC. Surprisingly perhaps, the Flora of the Bristol Region has only one site in the 10 km square. It is probably rather under-recorded as I have also seen it on tipped or disturbed soil beside the Portway in the Avon Gorge, G and in Leigh Woods by the Forestry Commission car park, S.

Salsola kali, L. **Prickly Saltwort** Uphill sand dunes, S, RSC. Otherwise recently recorded recently only near Sand Point, S and south of Brean Down.

Saponaria officinalis, L. **Soapwort**, Keynsham sewage works, JA; double-flowered plants well established on a rodside bank, Lime Kiln Cottage, King's Weston, G, BL; Pilning, G and Portway under Sneyd Park, G, RLB.

Persicaria amplexicaulis, (D.Don) Ronse Decr. **Red Bistort**, A single flowering spike by the roadside, New Passage, G, BL.

Hypericum androsaemum, L. **Tutsan,** Roadside in Abbot's Leigh village, woods at Brockley Combe and in a street, Congresbury, all S, RLB.

Malva neglecta, Wallr. **Dwarf Mallow**, Spontaneous, but in a cottage garden beside stone steps, School Road, Wrington., S, PM. Durdham Down,

G, on the site of the recently laid water main, and also in a gutter at Bedminster Down, S, RLB. This is a new square for the flora.
Malva moschata L. **Musk-mallow** In two places on the roadside on the A370 at Weston–super-Mare near the motorway, S, RLB. Not shown in this 10 kilometre square in the Flora of the Bristol region, but surely an oversight as it is recorded in the New Atlas.
Cochlearia danica, L. **Danish scurveygrass** Keynsham, near the weir, S, J Aldridge. New to the 10 km square, judging by the records in the Flora of the Bristol region (2000) but recorded in the New Atlas of the British and Irish Flora (2002). Ten further records from RLB in the Bristol area beside the Portway, M32 and M49.
Hirschfeldia incana, (L.) Lagr.-Foss **Hoary Mustard** At the bottom of the Gully (Walcombe Slade) by the Portway, Avon Gorge, G. Reported by Peter Hilton and noted by CML in 2002 there and below Black Rocks, G. Although not shown here in the Flora of the Bristol Region, the plant seemed abundant enough to have been there for a few years already.
Pyrola rotundifolia, **Round leaved wintergreen**, Over 100 flowering stems in a patch of two square metres under a willow tree in a limestone quarry near Ham Wood, between Wells and Shepton Mallet, S, RSC. This remarkable find is new to v c 6. It is an uncommon plant in Britain and particularly in the south, where it occurs in dune slacks, fens and in chalk quarries. Although native elsewhere, it is presumably a recent arrival here.
Samolus valerandi, L. **Brookweed**, Well established on muddy banks of a shallow pond at the power station, Chittening Warth, between Severn Beach and Avonmouth, G, BL.
Saxifraga hirsuta L., **Kidney Saxifrage**, A third Bristol record of this plant is given in the Winter 2004 number of AFP (Avon Flora Project) News, produced by the Bristol Regional Environmental Records Centre. Phil Williamson found it growing wild in "an overgrown and wooded part of one of the City's parks".
Rubus avaloniensis Newton & R.D Randall, **A bramble** In Watsonia 24: 443-446 (2003) this new microspecies of bramble is described. Within our area, it has been found at Shapwick, Burrington Combe, Worlebury Wood.
Pyrus pyraster, (L.) Burgsd. **Wild Pear**, RLB is carefully separating wild pears and apples from those recently appearing from discarded cores. He notes *Pyrus pyraster* on the cliff edge at Horseshoe Bend on the River Avon, G, and in a hedge at Chew Valley Lake, S. *P. communis* he notes in hedges at Lawrence Weston, G, and Failand, S.
Sorbus x thuringiaca, A hybrid **Whitebeam**. Under the name *Pyrus pinnatifida*, White describes the rarely seen tree from Leigh Woods. Mr P J M Nethercott showed it to me in 1977 and in 2002 I found it again. It is not far from the Coronation Avenue and though far from the margin of the wood, it is in an old clearing, possibly with mining hollows. The tree is

fertile and there is a specimen of Sorbus *bristoliensis* close by. The tree on the Plain by the Warden's cottages was propagated as a layer by Bob Russell in the 1970's. S.

Astragalus glycophyllos, L. **Wild Liquorice**, Wooscombe Bottom, near Compton Dando. S, JA. A rare plant in the Bristol Region but long known at various places near the River Chew.

Lotus glaber, Mill. **Narrow-leaved Bird's-foot-trefoil** One plant by the sea bank, Wick St Lawrence, S, RSC. This is a new locality for the southern coastline where it has hitherto been recorded near Portishead and Brean Sands.

Vicia tetrasperma L. (Schreb.) **Smooth Tare** Trackside on the Marle Hills, near Iron Acton, G, RLB.

Lathyrus sylvestris,L. **Narrow-leaved Everlasting-pea** Rodway Hill, S, several patches along the old railway line, RSC. Failand, beside a farm track and in a hedgerow, PM; Great Quarry, Avon Gorge, G, Bower Ashton and Ashton Gate, S, on verges of the A370, S, RLB. White mentions the Great Quarry site as dating back to 1878, although there are not enough records to prove it has been persistent there.

Lathyrus nissolia, L. **Grass Vetchling**, By the Long Ashton bypass, south of Long Ashton, S, PH. Recent new occurrences of this species may be as an adventive rather than a native. It was noted by PJM Nethercott in Bristol Botany in 1999 in the Great Quarry in the Avon Gorge, G, and it was still there in 2002, but I believe its habitat is now too overgrown to support it.

Lythrum salicaria, L. **Purple-loosestrife** Charlton Fields, near Keynsham, G. JA.

Euphorbia lathyris L. **Caper Spurge** New sites reported by RLB at Avonmouth, Frenchay and the Glen (Quarry at the top of Whiteladies Road near the Downs), all G. Also one plant in the interior of Burwalls Wood, Avon Gorge, S in 2003, CML, but abundant there under the Suspension Bridge briefly around 1978.

Rhamnus cathartica, L. **Buckthorn** By the Huntspill river, south of East Huntspill, S, RSC.

Smyrnium olusatrum, L. **Alexanders** Field edge near Failand, S, RLB.

Pimpinella saxifraga, L. **Burnet-saxifrage** In a roadside gutter, Jubilee Drive, Failand, an unusual habitat for this plant of calcareous grassland., S, PM.

Crithmum maritimum, L. **Rock Samphire** One plant flowering on the seaward side of the sea bank, Wick St Lawrence, S, RSC. This seems to be a slight eastward extension of the range in the Flora of the Bristol Region, for this familiar plant of coastal rocks, immortalised in Shakespeare's King Lear.

Aethusa cynapium, L. **Fool's Parsley**, A road verge near Failand. S, RLB.

Silaum silaus , (L.) Schinz&Thell **Pepper-saxifrage**, Frequent in a meadow at Draycott, S, RSC. The record appears to fill a gap in the Somerset Atlas.

Sison amomum L. **Stone Parsley** Avonmouth, G. Ashton Gate, S. Bower Ashton, S. all at roadsides, RLB.

Gentianella amarella,L. Borner , **Autumn Gentian** Professor AJ Willis has informed me that the note that this species was newly discovered in the Avon Gorge was a drafting error that he was unable to correct in proof. The Flora of the Bristol Region has no recent record of it but as White indicates, it has a long history in the Avon Gorge and had been known there since the late 18th Century. CML. The site mentioned in BB 2003, Quarry 4, was also seen by CML in 1978 and GW Garlick noted two other nearby sites in about 1950. Around 1980 Andy Byfield drew my attention to its occurrence in the lead workings on Clifton Down, G, although I have not found it there recently.

Datura stramonium, L. **Thorn-apple** Five plants on recently disturbed ground at the power station, Chittening Warth, between Severn Beach and Avonmouth, G, BL. Not recently recorded in this ten-kilometre square.

Echium vulgare L. **Viper's Bugloss** Roadside, Hanham Green, G, RLB.

Lamium hybridum, Vill. **Cut-leaved Dead-nettle** Two flowering plants on the verge of a track below Brean Down, S, RSC. The Somerset Atlas refers to it as occurring on Brean Down, where it was first found as recently as 1968, although long known in the vicinity.

Galeopsis tetrahit L. **Common Hemp-nettle** In woodland, Oldbury Court Estate, G, RLB.

Melissa officinalis, L. **Balm**, On a verge in Church Road, Leigh Woods S, PH, with *Linaria repens*; also in Abbots Leigh, S, RLB. I have a specimen of the Melissa collected in Leigh Woods below North Road in 1981.

Mentha x villosa Huds. **Apple-mint** Exuberant at a roadside in Failand, S, RLB; also in a verge on North Road, Leigh Woods, CML in 2003.

Verbascum nigrum L. **Dark Mullein** A single plant, Herons Green, Chew Valley Lake, S, RLB.

Verbascum blattaria L., **Moth Mullein** In allotments at Coombe Dingle, G, RLB.

Linaria repens, (L.) Mill. **Pale Toadflax**, One plant flowering and a few vegetative stems appearing recently on a wooden bridge, Max Bog, Winscombe, S, RSC. The recent New Atlas of the British and Irish Flora has no record for this 10-kilometre square.

Lathraea squamaria, L. **Toothwort** Two patches in Monk's Wood, south of Cold Ashton, G, and several patches in Weston Big Wood, S, RSC As a plant occurring in less than 5% of the one kilometre squares in the Bristol Region, and occurring in old woods, named localities are more valuable than distribution dot maps.

Rhinanthus minor, L. **Yellow-rattle** Keynsham , Manor Road Community woodland, S, JA. Also *Vicia hirsuta, Malva moschata. Lycopus europaeus*
Lathraea clandestina, L. **Purple Toothwort** On willow in woodland on the River Trym within less than a kilometre of the Avon at Sea Mills, G, PH.
Campanula latifolia L. **Giant Bellflower** Two white flowered plants 2000-2003 in the boundary ditch of Leigh Woods near the "Warren Wall", with *Cyclamen hederifolium* S, CML.
Adoxa moschatellina,L. **Moschatel** Wooscombe Bottom, near Compton Dando S, JA. Not recorded in this 1 km square (ST 6465) in the Flora of the Bristol Region though occurring in most to the south and west for 10 km. Also *Anenome nemorosa*.
Dipsacus pilosus, L. **Small Teasel** By the Avon, east of Keynsham, S, JA.
Cirsium eriophorum, (L.) Scop. **Woolly Thistle** King's Weston Down, G, RLB.
Cichorium intybus, L. **Chicory**, Two sites on verges of the A38, by the reservoirs at Barrow Gurney and at Havyatt Green, S, RLB.
Pilosella aurantiaca, L. **Orange Hawkweed** The Flora of the Bristol Region has 11 sites. RLB adds five: Bridge Yate Common, G; Cold Ashton, G; Frome valley between Stapleton and Frenchay, G; Compton Martin, S and Ubley, S. Although well established in Quarry 2 under Leigh Woods, S, as reported in Bristol Botany in 1980, it seems to have disappeared from there.
Gnaphalium uliginosum, **Marsh Cudweed** Felton Common, near Bristol Airport, also *Odontites vernus*; *Gnaphalium* also added by RLB in a field at Saltford, S. M Webster, Neither species is mapped in the Felton Common square in the Flora of the Bristol Region.
Chrysanthemum segetum L., **Corn Marigold** A roadside in Abbots Leigh, west of the A369 and the churchyard in Congresbury, S, RLB.
Senecio sylvaticus, L. **Heath Groundsel** A small patch in turf on Rodway Hill, G, RSC. According to White, it has been known there since 1796.
Galinsoja parviflora, Cav. **Gallant-soldier** Thousands of plants in a walled garden used for growing organic vegetables, Leigh Court Farm, Abbot's Leigh, S, PM.
Potamogeton natans,L. **Broad-leaved Pondweed** Abundant in a pool in Lord's Wood, Hunstrete, S, RSC. Ponds in ancient woodlands in the region and the aquatic plants in them deserve more attention. My favourite will always be *Menyanthes trifoliata*, the Buckbean, which grew in Leigh Woods, S, until the 1880's in J H Cundall's "sought-for spot…shut in with ferny rocks and gracefulness".
Eleogiton fluitans, **Floating club-rush** About ten clumps, along Rhyne number 23, Clapton Moor, Gordano Valley, also *Baldellia ranunculoides* a single plant on the bank , S, PM.

Carex extensa, **Long-bracted sedge**, Two large fruiting plants and two smaller ones, recently arrived in the salt marsh below the sea wall, West Huntspill, S, RSC. This is an extension of the range described in the Somerset Atlas Flora for this coastal salt marsh plant.
Carex strigosa, , Scattered in Monk Wood near East Cranmore, S, RSC. Additional to the sites mapped on a tetrad (2 kilometre square) basis in the Atlas Flora of Somerset.
Cyperus fuscus, **Brown Galingale** Ten small flowering plants and up to 40 vegetative were noted at its site in the Gordano Valley, compared to 60 flowering and over a hundred seedlings in the previous year, S, RSC.
Juncus foliosus, **Leafy Rush**, A good colony of flowering and fruiting plants in a wet flush in Lord's Wood, near Pensford, S, with *Holcus mollis*., S, RSC, Two segregates of the more common **Toad Rush** (*Juncus bufonius*) were recognised in Britain in 1978, but they probably remain under-recorded in the Bristol region.
Digitaria sanguinalis, , A single plant in the pavement, Burnham-on-sea, with *Amaranthus retroflexus*, **Common Amaranth**, S, RSC.
Calamagrostis epigeios, Plentiful on quarry floor, Crook Peak; nearby *Sedum album*, **White Stonecrop**, S, RSC.
Gagea lutea, L. **Yellow star of Bethlehem** 71 flowering stems were seen at Murder Combe, Great Elm, near Mells, S, RSC. The shy flowering of this plant is described by White, who saw six in flower there in 1900. I P Green found one flowering in 1997 after several years of observation. RSC also found one plant flowering at Littleton Wood, S, but only leaves at Grandmothers Rock, G.
Ornithogalum pyrenaicum, L. **Bath Asparagus** Charlton Fields, near Keynsham, 36 plants counted by JA; Ammersdown Park, 2 plants noted by RSC. We look forward to continuing monitoring of the counted populations
Cephalanthera damasonium, (Mill.) Druce **White Helleborine**, About a hundred plants below conifers, Cleaves Wood, near Coombe Hay, S, RSC. The population count is welcome addition to the site mapped in the Flora of the Bristol Region (2000). According to White, the first British record, by Thomas Johnson in 1634, was from "amongst the rockes not farre from Bathe". There is a July 1872 gathering from Coombe Hay in T B Flower's herbarium at Plymouth Museum, unmentioned in White.
Epipactis purpurata, Sm. **Violet Helleborine** Wooscombe Bottom, near Compton Dando, S, JA. Five plants, two strong and three less so, on private land. The site is several kilometres north of the Hunstrete locality mentioned in the Flora of the Bristol Region. All helleborines other than the broad leaved helleborine are very scarce in the Bristol region.
Neottia nidus-avis, (L.) Rich. **Bird's-nest Orchid** Weston Big Wood, near Portishead, S, the northern edge at the top of steps leading up from Valley Road, S, PH. At the Ammersdown House locality referred to in BB 2003, S,

RSC. This saprophytic orchid is sporadic in appearance and the continued observations are of interest.

Spiranthes spiralis, (L.) Chevall. **Autumn Lady's-tresses**, 570 plants in flower on the lawns of the National Trust property, Tyntesfield, between Failand and Wraxall, S, PM. A single plant on Hellenge Hill, S, RSC. The Tyntesfield record is additional to the sites mapped in the Flora of the Bristol Region, though White refers to several sites in the neighbourhood.

Anacamptis pyramidalis, (L.) Rich. **Pyramidal Orchid**, Near a car park, Wooscombe Bottom, near Compton Dando, S, JA. Two plants, one 62 cm tall (Stace's flora indicates stems to 60cm). White refers to its occurrence here and there between Compton Dando and Keynsham. Also nearby at Charlton Fields, in three places, one with 192 plants. The plants now appearing seem to be more robust than formerly. In the Avon Gorge it seems to have disappeared in the 1970's only to re-appear later. In 2002 I saw strong plants on Clifton Down at the top of Bridge Valley Road and in two places on the towpath under Leigh Woods.

Dactylorhiza fuchsii, **Common Spotted-orchid** Two plants about half a kilometre inland, Severn Beach, G, BL. The Flora of the Bristol Region has no records for this common orchid within several kilometres of the estuary in the Gloucestershire side of the area.

Dactylorhiza praetermissa, (Druce) Soo **Southern Marsh Orchid** Several flowering plants of this orchid of marshy ground colonising dry limestone grassland at Sandford Hill, Sandford, S; and there hybridising with *D. fuchsii*. *Orobanche minor* (**Common Broomrape**) was nearby. S. RSC.

Orchis mascula, (L.) L. **Early Purple Orchid** Wooscombe Bottom, near Compton Dando, S, JA. Six flowering plants and an estimated 35 in total; this orchid was described by White as well distributed and only aberrant forms were localised. The Flora of the Bristol Region has only two sites in the whole 10km square.

Ophrys insectifera, L. **Fly Orchid** About 30 spikes were found in 2004 at the Ammersdown House driveway site referred to in BB 2003, an increase on the dozen first found in 2003. S, RSC.

Ophrys apifera, Huds **Bee Orchid** Two spikes close by the estuary at Chittening Warth, G, BL. This beautiful plant is not apparently otherwise known within five kilometres.

Ophrys apifera var trollii, **Wasp Orchid** Wooscombe Bottom, near Compton Dando, S, JA. A single plant of the less attractive form of the Bee orchid, illustrated by Miss F Cundall in White's Flora and so long known from the Avon Gorge where it occurs on both sides in mixed populations with the typical form. Also nearby at Charlton Fields, in two places.

Aliens

Laurus nobilis L. **Bay** A single young plant, self-sown, edge of Ashton Hill plantation, S, RLB.
Alnus incana **Grey Alder** In the Great Quarry beside the Portway, Avon Gorge, G, RLB and CML, independently. There are several bushes beside old car parking spaces seemingly spreading and naturalised.
Cerastium tomentosum L. **Snow-in Summer** Nine additional square kilometre records are provided by RLB for this obviously under-recorded garden escape. There are 65 records in the Flora of the Bristol Region.
Fallopia baldschuanica **Russian-vine**. Bannerdown, near Batheaston, G, RLB.
Hypericum calycinum **Rose-of-Sharon** Abbot's Leigh village, S, RLB.
Alcea rosea L. **Hollyhock** Road verge at Backwell, S, RLB.
Aubretia deltoidea (L.) DC, **Aubretia** On walls in Stoke Bishop, Abbot's Leigh and Congresbury, S, RLB, The Flora of the Bristol Region has only seven records. I saw it growing truly wild on St Vincent's Rocks on the buttress under the Suspension Bridge in 1978 whilst dangling from a rope. It also grew from garden rubbish thrown into Leigh Woods from North Road around 1980 (CML and RV Russell).
Cyclamen hederifolium Aiton **Sowbread** Abbots Leigh S, roadside near the church, RLB; also in Leigh Woods, 2003, in the wood boundary ditch near the "Warren wall" S, CML.
Saxifraga x urbicum, **Londonpride**, Cadbury Lane, S, RLB - not far from the former home of Sampson Clay, author of a book on rock gardens.
Duchesnia indica (Jacks.) Focke, **Yellow-flowered Strawberry**, In the square, Upper Berkeley Place, Clifton, G, RLB.
Laburnum anagyroides Medik. **Laburnum** Self-seeding on a roadside at Limpley Stoke, S; RLB; also at Avonmouth, G, RLB.
Myriophyllum aquaticum, (Vell.) Verdc **Parrot's-feather** In a pond, Hanham Green, G, RLB; also *Ranunculus lingua* L., **Greater Spearwort**, G, RLB. The Flora of the Bristol Region has only three records for the *Myriophyllum*.
Fuschia magellanica Lam. **Fuchsia** A garden throw-out but flourishing on a roadside at Failand, S, RLB.
Euphorbia characias L., **Mediterranean Spurge** On waste soil, Berwick Lodge, near Hallen, G; also *Lonicera nitida*. RLB.
Frangula alnus Mill. **Alder Buckthorn** Kingsweston Down, G, but planted in a hedge. RLB.
Oxalis corniculata L. **Procumbent Yellow-sorrel** Abbots Leigh, S, and Combe Dingle, G, RLB.
Impatiens glandulifera Royle **Indian Balsam** By a pond near the Long Ashton bypass, at Herons Green, Chew Valley Lake and Brockley, all S. RLB.

Lycium barbarum L. **Duke of Argyll's Teaplant** At the riverside, Netham, Bristol, G, RLB.

Petunia x hybrida, **Petunia**, A single purple flowered plant near the Portway at the bottom of the Gully, Avon Gorge, G, CML and Libby Houston, independently. There is no record in the recent Flora of the Bristol Region (2000), nor for v.c. 34 in the BSBI vice county census catalogue (2003). The Atlas Flora of Somerset (1997) has a solitary record (1990) for Glastonbury.

Borago officinalis, L. **Borage** Charlton Fields, near Keynsham, S, JA; also on Nailsea Moor, S, RLB. The Keynsham site seems to be the first recent record of this rather ephemeral plant for this 10 kilometre square.

Stachys byzantina **Lamb's-ear**, Clifton Down, near the top of Whiteladies Road, ,. RLB. Not recently recorded in the Bristol region and new to the flora of the Avon Gorge.

Rosmarinus officinalis L. **Rosemary** Growing in a wall, Sneyd Park, G, RLB.

Asarina procumbens Mill. **Trailing Snapdragon** On a wall in Frenchay, near the weirs, G, RLB, This is new to the Bristol region and v.c.34.

Campanula portensclagiana Schult **Adria Bellflower** Found wild by RLB on walls in Abbot's Leigh, Brentry, Clapton, Cold Ashton, Congresbury, and Frenchay. This and the next species are considered to be under-recorded and expanding by the authors of the Flora of the Bristol Region; these sites are additional to the 50 in the Flora.

Campanula poscharskyana Degen **Trailing Bellflower** Found wild by RLB on walls in Abbot's Leigh, Iron Acton and Speedwell. These sites are additional to the 19 in the Flora. In 1978 I collected it from plants established from garden throw- outs in Leigh Woods below North Road (det. E J Clement) and in 1980 saw it on the Downs side of a garden wall near Sea Walls on Durdham Downs.

Leycesteria Formosa Wall. **Himalayan Honeysuckle** Pixtons Green, between Marshfield and Batheaston, at a field edge, G, RLB; also by a roadside at Cleeve, S, with *Lunaria annua*, S, RLB. It is difficult to believe the plant is as rare as the Flora of the Bristol Region suggests.

Tragopogon porrifolius **Salsify** Kings Weston, G, RLB.

Erigeron karvinskianus DC, **Mexican Fleabane** Three new sites reported by RLB, Abbot's Leigh, Cleeve Hill (both S) and Conham, G.

Leucanthemum x superbum D.H.Kent **Shasta Daisy** At the northern end of the Great Quarry, Avon Gorge, G, also Lythrum salicaria, G, RLB. There have been a number of weeds and plants of garden origin on the quarry bottom in recent years, either on banks blocking the former vehicle entrance or on disturbed soil nearby.

Helianthus annuus L. **Sunflower** There were surprisingly few records in the Flora of the Bristol region (8). RLB adds two in 2004, from Abbots Leigh, S, by a wall near the church and at Poulson's Farm, south of Marshfield, G.
Briza maxima. **Greater Quaking- grass** Roadside beside the New Cut, Bristol, RLB. The Flora of the Bristol Region has three records of this casual grass over a period of almost 20 years.
Convallaria majalis **Lily of the Valley**, In Burwalls Wood, Leigh Woods, S, RLB. This appears to be the puzzling occurrence under a restraining wall on Burwalls road which I only noted in 2002. It does not appear to be an extension of the known native range in Leigh Woods. RLB mentions Leycesteria formosa and Lonicera nitida in the same place. The former occurred around 1980 in the woods under the Suspension Bridge and the latter has been growing in the quarry at the top of Nightingale valley for a decade or more.
Polygonatum x hybridum **Garden Solomon's-seal** A garden throw-out at a roadside in Avonmouth, G, RLB.
Muscari armeniacum Leichtlin ex Baker **Garden Grape-hyacinth** By a path, St George, Bristol, G, RLB.
Leucojum vernum **Spring Snowflake**, On a roadside at Failand, S, RLB. According to the Flora of the Bristol Region, the last record was in 1982.
Asparagus officinalis **Asparagus** A single plant in the Avonside marsh between Sea Mills and Horseshoe Bend, G, RLB. Despite a long history by the Avon below Bristol, and the persistence of a good patch under Leigh Woods opposite Bridge Valley Road, the Asparagus seems always to be seen irregularly and only in small quantity on the Gloucestershire side.
Iris germanica L. **Bearded Iris**, Avonmouth, G, near the motorway interchanges, as a throw-out. RLB.
Gladiolus communis L. **Eastern Gladiolus**, Waste ground, Avonmouth, G, RLB.

Invasive Aliens in ST 57 woodland.

R.L.Bland
11 Percival RD BSA8 3LN Richardbland@blueyonder.co.uk

Survey origins and methods.

Recent articles in BSBI News have suggested that we should be more aware of the dangers to woodland posed by invasive species such as Laurel, Holm Oak, and *Rhododendron ponticum*. Fifteen alien species were checked in 10-km square ST57, bounded by Avonmouth and Southmead in the north and Wraxall and Lower Knowle in the south. The survey was carried out between November 2004 and the end of February 2005 by walking a series of transects. The actual purpose of the walks was ornithological, and they were designed to cover every tetrad in the 10km square by walking a kilometre transect across each 1-km square. Fifty hours were spent walking some 150 kilometres at a speed of three KPH, and in all 90 1-km squares were visited, many of them more than once. The presence of each of the alien species, listed in Table 1, was noted for each square visited. No attempt was made to assess how often a species was seen within a 1-km square. Winter is a good time to check these species as the fact that many of them are largely or partly evergreen means that they stand out much more obviously in winter than they do in summer. The yellow leaves of Norway Maple, *Acer platanoides*, stand out spectacularly in November and December until its leaves drop, but it was not recorded on visits in January and February. Japanese Knotweed, *Fallopia japonica,* has dead stems that are very obvious unless they are cut back. Winter Heliotrope, *Petasites fragrans,* comes into flower in late November, and its leaves are far more dominant in the winter period than later in the year. Turkey Oak, *Quercus cerris,* is partly evergreen in some winters, but often holds its leaves long after other oaks, and can be easily recognised from its buds.

The distribution of some of these species recorded in the Flora of the Bristol Region (SL Myles 2000) (henceforth called the Flora) does not distinguish between woody species that have been planted intentionally, and those that are self-sown. It is important to the study of the process of botanical change to concentrate on species that are aggressive, and hence leading the process of change, and, because they are evergreen, capable of bringing about rapid and extensive botanical change. The capacity of Rhododendron, Holm Oak, Japanese Knotweed and Winter Heliotrope to dominate sites is well known. Hence a species was only recorded in this survey if it was clear that it was self-sown rather than planted, which often meant recording young plants.

Species Comment.
The species are listed in order of their actual distribution in the 90 squares. The figure given is the percentage of the 90 squares in which they were found by this survey.

Buddleia *Buddleia davidii*. 64%. This is universally present as a wild plant within the city of Bristol, very often growing on walls and from chimneys. In the rural areas it is less widespread, and was not found in three squares, though I have little doubt that it could be found. It is a frequent invader of any piece of rough ground left uncultivated, and of waysides. It cannot be considered a dangerous species, as its flowers are an attractive source of nectar in late summer, and it does not dominate its surroundings.

Japanese Knotweed, *Fallopia japonica.* 30%. This species spreads very rapidly because any small piece of root or stem base, if dumped anywhere, will become a new plant. Once established it spreads from very deep rhizomes, and totally dominates the area it occupies. It is very difficult to eradicate, and has no obvious enemies. Although it is most frequent along roadsides, river banks, and waste sites where rubbish is tipped, it can be found in more remote areas. It does not appear to regenerate from seed in this climate. It was not recorded in half the squares in which it was recorded in the Flora, probably because, as its distribution is in small clumps, it was readily missed by a single transect survey. It was found in eight new squares which may represent a real spread since the work was done for the Flora.

Laurel, *Prunus laurocerasus.* 37% It is unsurprising that this popular garden hedging plant, which produces black fruit very attractive to Blackbirds in the late summer, has spread rapidly, as its seeds rapidly germinate, and it can grow very fast. It can dominate the under-storey of woodland to the exclusion of all other species, and was found to be doing so in parts of Tyntesfield Plantation and Ashton Hill Plantation. It had been recorded in 23 squares, and was found in 20 new ones, suggesting both that it was undercounted in the past, and that it is expanding fast.

Winter Heliotrope, *Petasites fragrans*. 23%. This is primarily a plant of roadside edges, and sometimes of woodland. It flowers during the winter, and is thus a useful source of winter nectar, but it does tend to dominate the areas in which it occurs. It is tough and hard to eradicate. It was known from 30 squares, and found in a further eight, which suggests that it is spreading, as it is not a difficult plant to identify.

Norway Maple, *Acer platanoides*. 22%. This species is a close relative of the Sycamore, and its seeds germinate rapidly, and outgrow other seedlings in the first year, so that it can readily come to dominate the under-storey in woods, though there are still comparatively few woodland seed trees. It is very widely planted as a street tree. Young plants have brilliant yellow foliage, and are easily spotted in the autumn. It seems likely that it will become an increasingly common woodland species. The Flora did not record forest trees particularly well, so this species was only recorded from 26 squares, but it was recorded as self sown in 20, 11 of them new.

Snowberry, *Symphoricarpus albus.* 20%. This is an invasive small shrub with white berries that nothing seems to eat, but which are clearly capable of spreading the plant. The berries, and thus the plant, are very obvious in winter. If cut down, it immediately regenerates from the roots. It is common in garden hedges, and has often spread from them as a roadside hedge plant, and can also be found on waste ground. It was known from 32 squares and found in a further five.

Turkey Oak, *Quercus cerris.* 21%. The Turkey Oak is semi-evergreen, grows very fast, and has a large acorn. It is also host to the gall midge which produces the galls on Common Oaks, *Quercus robur,* that have cut down acorn production in the past twenty years. It has spread largely unnoticed and very fast, because it is very similar to the Common Oak in appearance, and may be making a take-over bid. It was recorded from just 13 squares, but was found in another 13, which suggests that it was seriously under-recorded in the Flora, and is spreading.

Holm Oak, *Quercus ilex.* 23%. Of all the species surveyed this is probably the most potentially threatening, and perhaps spreading the fastest. It produces masses of acorns that are spread very widely by Jays. It can frequently be found germinating in walls. It grows rather slowly at first, but, as it is fully evergreen, it soon comes to dominate its surroundings, suppressing all other growth. If cut down it regenerates at once, and is often found as a cluster of boles as a result. It has readily invaded motorway cuttings, especially on the Tickenham ridge, parts of which it dominates. It is also becoming a serious menace on the Bristol Downs. It was known from 15 squares, but was found in another 11, and is thus probably a good deal more widespread in reality.

Wilson's Honeysuckle, *Lonicera nitida.*12%. This member of the honeysuckle family is a very common garden hedging plant that produces juicy fruit if given half a chance. It also regenerates very readily from clippings, and can be found in a wide variety of habitats as a result. It

becomes a scrambling plant in woodland, but is no threat to its surroundings. It is very easily missed in summer, and also is easy to ignore as not every botanist is also a gardener. It was known in 10 squares, and found in another 11.

Rhododendron, *Rhododendron ponticum.* 8%. This plant is very well known as a menace in other parts of the country, but, as it needs an acid soil, there are few areas here where it can flourish. However given the chance it comes to dominate the under-storey of woodland even more completely than Laurel, and does so in one or two local woodlands such as Church Wood, in Ashton Court. It readily regenerates if cut down. It was known from 13 squares and discovered in another three. It has little chance of expanding beyond the acid areas, but plenty of opportunity within them.

The last five species are, at present, of little significance, but are included because they might become a problem.
Portuguese Laurel, *Prunus lusitanica,* 9%, is less aggressive than Laurel, and rather rarely do seedlings result from its fruit, which are valued by birds. It was known in five squares and found in five new ones.

Stags Horn Sumach, *Rhus typhina,* 1%, spreads by suckering, and can take over a wide area. It is a common garden plant, but its fruit is heavy and not edible. Hence its occurrence in the wild is usually the result of dumping. It was known from seven squares and found in one new one.

Himalayan Honeysuckle, *Leycesteria Formosa,* 4%, is an uncommon garden plant, which produces juicy seeds that are very popular with birds, which have spread it to walls in the city, and waste spots outside it. It is not an aggressive plant, and could be considered an asset.

Bay, *Laurus nobilis,* 4%, is very common as a garden plant in older gardens in Bristol. It is not totally hardy but, like Eucalyptus, will shoot back from the root if cut back by frost. It also suckers from its roots, so most trees are clusters of boles. Its ripe fruit are very popular with Wood Pigeons in October/November, and readily germinate. However as a baby plant it is rather feeble, perhaps because our summers are not warm enough, and hence it has not spread as widely as Laurel. However it is very easy to overlook in summer, and was only recorded from one square, but found in four more. It may be commoner in the wild than is recognised, and, if summers become warmer, may start spreading faster.

Laurestinus, *Viburnum Tinus***,** 3%, is widely planted in gardens for its attractive white winter flowers. It thus stands out in the wild in winter. It has

fruit that ripen in the autumn just before the next flowers open, and is spread by birds. It was known in two squares, and found in another one.

Overall Results.

Every square had at least one alien species, and the average was 4.7 species per square. Square 5577, Coombe Dingle, had acquired 12 of the 15 species. Some squares had only one or two species either because the habitat gave them little opportunity, or because the route of the transect, which was always along public rights of way, was on poor habitat. The Flora showed that there were 319 registrations of the 15 species in the 90 squares. This survey added a further 116 registrations in 60 of the 90 squares, and confirmed 151 of the existing registrations (48%). The survey missed 158 of the registrations (51%), which suggests the limited level of efficiency that a simple survey of this kind can achieve. If botanical change is to be measured effectively it is important to find simple survey methods that can identify the rate of change effectively. It might be suggested that the substantial number of new registrations is evidence of rapid change, but it is more likely that the species concerned were under-counted by the original survey, since they are not part of the native flora, and could easily be overlooked in summer surveys.

Species	Distribution	New
Buddleia	78	8
Japanese Knotweed	55	8
Laurel	43	20
Winter Heliotrope	38	8
Norway Maple	37	11
Snowberry	37	5
Turkey Oak	26	13
Holm Oak	26	11
Wilson's Honeysuckle	21	11
Rhododendron	16	3
Portuguese Laurel	10	5
Stag Horn Sumach	7	0
Himalayan Honeysuckle	6	4
Bay	5	4
Laurestinus	3	1
Total	425	116

Table 1 shows the 15 species in order of their distribution in the 90 squares of ST57, and shows the total number of new registrations for each species. The total recorded in the Flora is column 1 less column 2.

The rural/urban divide. 38 of the squares are rural, 52 urban. Of the 116 new registrations, 46 were made in rural areas, an average of 1.2 per square, compared with an average of 1.3 per square in urban areas. Half or more of new sightings were made in rural areas for Buddleia, Snowberry, Japanese Knotweed, Himalayan Honeysuckle, Laurel and Winter Heliotrope, which may imply a move out of urban areas, or that such garden aliens were more likely to be recorded as such in the urban area in the original survey. It may also be a general consequence of steady development of rural areas.

Conclusion. Botanical change is being driven by a wide variety of factors, and in every generation there have been new species introduced many of which find some niche in the wild. There is a pattern to alien introductions in which there is an initial, and alarming, population surge in consequence of a lack of competition and predators, followed by a decline, and the creation of a new stability. Every introduction alters the opportunities for other species, and has in some cases lead to local extinctions of existing native species. An understanding of the complex processes of change at work is vital if effective conservation is to be possible, and simple monitoring methods need to be devised to ensure a sound knowledge of the process of change.

Silverweed

Poppies, a note.

RL Bland
11 Percival RD BSA8 3LN

Plantlife ran a national survey in 2004 on the distribution of five species of red poppy. I was involved in a survey of Swallow feeding during June and July, which involved a great deal of driving to specific isolated sites around the region, so I simultaneously kept detailed notes of the Poppies that I saw.

On my travels I passed through 169 1km squares, 11% of the surface area of the region, noting poppies where I saw them. I stopped frequently, and walked some distance to reach my Swallow survey points. The survey had the merit of being random, but certainly was not thorough. In July, however, the Poppy is very obvious, and the fact that I found Common Poppy in 39 squares in which it was not reported in the Plant Atlas 2000 suggests that the method is not without merit. This was a very high proportion, 42%, of the squares in which I did find it and implies either that it is under-recorded in the Atlas, or, less likely, that it is an expanding species.

In the Plant Atlas the Common Poppy is recorded in 554 Squares, 37% of the total. The Long-headed Poppy is much less widespread, reported in 177 Squares, 12%. I found the Common Poppy in 92 squares, 54% of those I visited, and the long-headed Poppy in just seven, 5% of the total. One possible reason is that the long-headed poppy perhaps flowers earlier, and for a briefer period than the Common Poppy. I discovered it once or twice in fields, effectively invisible because it had ceased flowering. But it is clearly a species that has to be sought for, and my methods were unlikely to find it. The Plantlife Survey wanted habitat details, and it is worth noting that 57% of my sightings were on roadsides, and only 22% in fields. Gardens and waste sites made up the remaining 20%.

A note on the growth rate of ancient Hawthorns

R.L.Bland
11 Percival Rd BS8 3LN

There are a number of ancient hawthorns on the Bristol Downs, often with twisted multi trunks, and ageing them is a problem. Hawthorns, like other shrubs, grow much more slowly than trees, and the fact that they do not have a massive girth has had the consequence that their potential age is usually underestimated. Their trunks thicken in the manner of all trees for many years, but as they get older, like many shrubs, they tend to sucker from close to the trunk, and thus become multi trunked. This process can be readily observed on the Downs. I was recently able to count the rings of an old branch that had been trimmed from an older trunk. The branch had a diameter below the bark of 180mm, and the rings were very close set. I was able to count 22 rings on a 20mm section of radius, so that the implication was that this branch was 90 years old. The diameter of the trunk of which it was a part was 426 mm, implying an age of 200 years. A tree of that oage would have a diameter four times as great. The Hawthorn had four separate trunks, with a total circumference around them of 3200mm, though there were of course large gaps between the trunks. This would imply a maximum age of 500 years, making the tree one of the oldest in Bristol.

The rule of thumb for the growth of most British trees in an open situation is an increase in circumference of 26mm year. This is exceeded by Poplars, Willows, and alien species such as Sequoia, and is less for trees growing inside woods, and in situations where the soil is poor, such as on cliffs. The rate also initially reduces after pollarding, or other severe damage to a tree. It seems likely that the growth rate of the circumference for Hawthorn, and perhaps for similar shrub species in an open situation, is about a quarter of this, or 6mm a year. A hawthorn in a hedge is likely to have a much lower rate of growth, as it is in effect more or less continuously pollarded. Hawthorns and other plants in hedges laid in the traditional way often have large and very complex boles that are very difficult to measure, but their circumference provides a potentially significant method for estimating the age of hedges which must be at least as old as the oldest plant within them.

Mycological records for the Bristol area 2004

Justin Smith

After a disastrous year in 2003, rain began to fall steadily from July 2004, wetting the ground enough for many fungi to fruit. Many species of interest were encountered, some rare, some simply overlooked of difficult to identify. Some species were identified by Roy Betts of the North Somerset and Bristol Fungus Group and are labelled RB, and others by Brian Spooner at Kew, labelled BS.

Lepiota forquignonii. This is an olive tinged 'parasol' mushroom of calcareous woodland Weston Big Wood.
Lepiota subalba. A whitish 'parasol' mushroom, also Weston Big Wood, July.
Lepiota subgracilis. This species has never been found before by me, but this year appeared at Goblin Combe, Blaise Castle, and Weston Big Wood, July-October.
Lepiota oreadiformis. A rare species, recorded on calcareous grassland on both Dolebury Warren and Walton Common, September.
Pholiota flammans. A fiery yellow shaggy capped species, though not rare, found on Spruce at Folly Farm, August.
Inocybe phaeolisca. A small brown fungi of mixed woodland, with a strongly contrasting cap margin to the umbo, Folly Wood, August.
Inocybe amblyspora sensu Kuhner. A small rust brown 'fibre-head'. Among Spruce, Oak and Hazel, Folly Wood, July.
Conocybe mesospora. Identified microscopically, a tawny orange small species of woodland clearings and meadows, Dowlings Wood, September.
Conocybe semiglobata. A tawny orange species of open grassland only identified microscopically, Dolebury Warren, September.
Russula melliolens. A rare species, with a slight honey smell when dry, yellowish gills and a pink cap. Associated with Oak, Dowlings Wood, September.
Hygrocybe ovina. A rare red data book waxcap, typified by duller colouration than other members of the genus, found for the fourth year running on Dolebury Warren, September.
Psilocybe pratensis. A small grassland species with a separable elastic pellicle on the cap, Dolebury Warren, September.
Clitocybe costata. An overlooked 'funnel cap' discovered under Beech at Blaise Castle RB.
Hypoxylon cohaereens var microsporus, An overlooked pyrenomycete fungus on Oak at Blaise Castle, September. BS

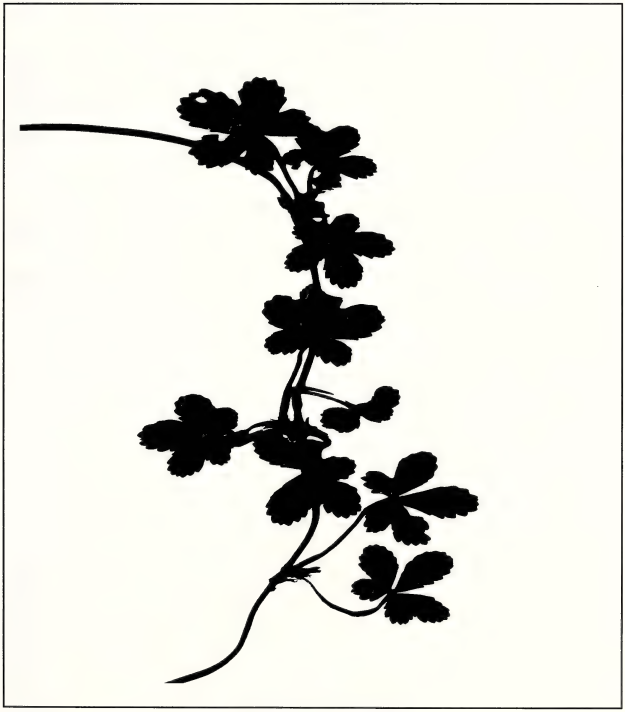
Leucoagaricus croceovelutinus. A rare 'parasol' mushroom which bruises reddish when touched. In calcareous beechwoods at Blaise Castle. September.

Leucoagaricus badhamii. A rare 'parasol' mushroom which bruised strongly brick red when touched. Weston Big Wood, October.
Panaeolus fimicola. A dark coloured 'mottle gill' of manured ground, Dolebury Warren, September.
Rhodocybe gemima (*R truncata*). A large chunky reddish-brown species forming fairy rings near Larch and Hawthorn on Ashton Court Meadow, August-November.
Crepidotus calolepis. A stemless soft slipper toadstool with rufous scales on the cap. Found on cut ash logs in a garden in Windmill Hill, October, and Folly farm in August.
Psathyrella polycistus. An overlooked brittle cap in nettle scrub related to P. gracilis and P. Microrhiza at Little Wood, Yatton, October.
Entoiloma euchroum. A blue-capped pink gill on Alder wood at Little Wood, Yatton, October.
Limacella ochraceo-lutea. A very rare species in Europe (acc Breitenbach&Kranzlin 1995), which was found in abundance at Weston Big Wood, August-September. It was more abundant that on any previous occasion since first found in 1997. There are currently only four sites known in the UK. Typically it has a slimy yellow cap and stem.

Pluteus satur. An overlooked species, typically hygrophanous, unlike other members of the genus. On an Ash log, Weston Big Wood, October.
Clytocybe agrestis. Part of an extremely difficulty group within the funnel caps that turned up at Dolebury Warren, Itchington Common, and Ashton Court Meadow.
Clitocybe foetens. A funnel cap from a difficult group of darker woodland species, overlooked. Dowlings Wood, November.
Russula cessans. A rare pinewood species with ochre gills as found in *R melliolens*, Ashton Court Meadow, October.
Tricholoma cinglatum A ringed pale greyish species found in a fairy ring with Goat Willow, Ashton Court Meadow.
Hygrocybe aurantia splendens. A yellow wax-cap with primrose stem apex at Ashton Court Meadow, October.
Volvariella surrecta. A parasitic mushroom on old fruitbodies of Clouded Agaric, Clitocybe nebulans. Greyfield Wood, October.
Xerocomus (boletus) parasiticus. A parastitc fungus on Common Earth Balls (*Scleroderma citrinum*) at Greyfield Wood, October.
Entoloma bloxamii. A rare blueish chunky 'pinkgill' variously interpreted as an RDB, but typical of calcareous grassland, Dolebury Warren, October.

Lepiota calcicola. A rare scruffy brown 'parasol' mushroom of calcareous woodland, Dowlings Wood, November.
Faerberia carbonaria. A rare species of cantharelloid fungus of firesites, Dolebury Warren, December.
Tyromyces placenta. A pink poroid respiviate on a Larch log at Goblin Combe, December.

Psathyrella brifrons. A new species for the Bristol area, found at Goblin Combe in May and Blaise Castle in October. JS+RB
Coprinus spelaiophilus (syn extinctorius). A small inkcap at Folly Farm inside an old hollow Ash trunk, November. RB



Creeping cinquefoil

Bristol Mammal Report 2004

David P. C. Trump
Windrush, West End Lane, Nailsea, Bristol BS48 4DB
e-mail: d.m.trump@tinyworld.co.uk

INTRODUCTION

The intention of this mammal report is to be a wide-ranging review of the records and studies of mammals in and around the Bristol area and to report on significant issues and events affecting British mammals in 2004. The number of one-kilometre squares in which those species were positively recorded is given in brackets after the scientific name, followed by the number of one-kilometre squares for 2003, 2002, 2001 and 2000. Where no grid reference was provided, the record is not included in this total. The former county of Avon covers an area of approximately 1300 square kilometres, and so the number of 1 km squares for which records have been received gives an indication of the abundance of each species. All grid references are for the 100 km grid square ST. The differences between the years is likely to be due to changes in numbers and locations of recorders rather than changes in mammal abundance or distribution.

INSECTIVORA (hedgehogs, shrews and moles)

Hedgehog *Erinaceus europaeus* *(26 1-km squares for 2004, 26 for 2003, 45 for 2002, 38 for 2001)*

There were road casualty records from the following 1-km squares:- 4363, 4463, 4666, 4670, 4671, 4677, 4770, 5266, 5281, 5633, 5661, 5672, 5773, 5777, 5779, 5780, 5781, 6668, 6894.

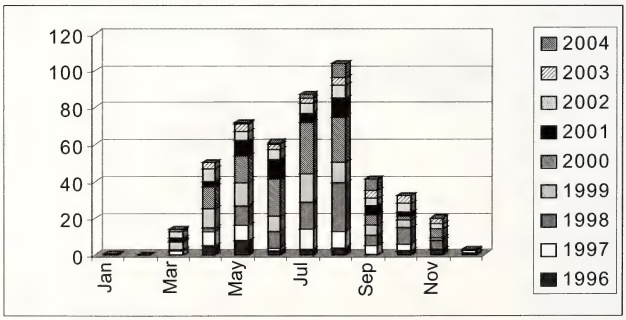


Figure 1. Number of Hedgehog Road Casualty Records per Month 1996-2004.

Nine years of data and 485 records of road casualty Hedgehogs show two main peaks, a smaller peak in May when most Hedgehogs have emerged from hibernation and a larger peak in July/August when the young of the year disperse (Fig. 1). Hedgehog road casualties have now been recorded in every month of the year except February.

Other records from: 4870, 5572, 5585, 5773, 5876, 6075, 6893.

Recorded by RLB, JFB, PJC, ED, HN, S&JP, JR, DT, MT, DWi.

'How will hedgehogs cope in the big city?' A group of 46 hedgehogs from the island of Uist in the Outer Hebrides were to be released into gardens in Bristol to see how successfully they would adapt to a new environment. Professor Steven Harris of the University of Bristol planned to fit the hedgehogs with radio transmitters to see how the released hedgehogs behave and interact with the local hedgehog population. The project, partly funded by the International Fund for Animal Welfare, aims to see whether it is possible and humane to relocate hedgehogs (*Bristol Evening Post* 4 May 2004).

Mole *Talpa europea (63,56,63,69,151)*
Records of Mole hills from the following 1-km squares: 4169, 4569, 4565, 4566, 4873, 4964, 5064, 5071, 5072, 5165, 5276, 5371, 5372, 5373, 5376, 5377, 5471, 5472, 5473, 5476, 5478, 5479, 5571, 5572, 5577, 5585, 5669, 5670, 5678, 5779, 5878, 6071, 6083, 6176, 6188, 6276, 6269, 6271, 6278, 6281, 6371, 6376, 6377, 6380, 6379, 6477, 6478, 6479, 6582, 6583, 6783, 6972, 7083, 7376, 7474, 7475, 7573, 7574, 7677, 7685, 7777, 7962, 7985.

Recorded by RLB, PJC, JR, DT.

Common Shrew *Sorex araneus (2,5,4,3,1)*
Records from the following 1-km squares: Nailsea West End (4569) - one found dead in garden (DT); Pilning (5585) - several records form a large rural garden – all killed by cats (JR).

Pygmy Shrew *(0,6,4,0,0)*
No records for the year.

Water Shrew *Neomys fodiens (2, 2,2,0,0)*

Two records for the year; one seen feeding in tidal debris at Severn Beach (5384) on 21 March (PB); One flushed from boulders by high tide at Severn Beach (5385) on 21 March (BL).

The Mammal Society is concerned that the water shrew may be disappearing from our countryside due to habitat loss, pollution and pesticide use. They are running a study where volunteers place small tubes containing food near water for two weeks. Shrews will hopefully eat the food and leave their droppings. The study will provide a baseline against which further studies can be measured. *(BBC Wildlife* ***22*** *(7) July 2004).*

The Avon Wildlife Trust undertook a 'Mammal Society' water shrew survey of a number of sites in North Somerset between December 2003 and February 2004. Of the 23 sites, 11 were nature reserves, two were fisheries, seven were on agricultural land, two were owned by local water authorities and one was an urban site. At each site a number of bait stations were set out (48 in total, on different types of water course or water body), each comprising 5 plastic tubes baited with castors (blow fly pupae). Ten sites (including five nature reserves) were positive for water shrews, determined by the presence of aquatic invertebrate exoskeleton remains in the scats collected from the tubes. Of the 48 bait stations, 12 were positive for water shrews. (*North Somerset Otter Group Newsletter*, Issue 16 Spring 2004).

CHIROPTERA (Bats)

Greater Horseshoe Bat ***Rhinolophus ferrumequinum (0,1,1,0,1)***
No records for the year.

Lesser Horseshoe Bat ***Rhinolophus hipposideros (0,4,9,0,3)***
No records for the year.

Whiskered Bat/Brandt's Bat ***Myotis mystacinus/brandtii (0,1,1,0,0)***
No records for the year.

Natterer's Bat ***Myotis nattereri (0,1,3,1,3)***
No records for the year.

Bechsteins Bat ***Myotis bechsteinii (0,1,1,0,0)***
No records for the year.

Daubenton's Bat ***Myotis daubentoni (2,0,2,1,0)***

Two records for the year, one seen flying over the pond in Sneyd Park Nature Reserve (5575) on 9 May (ED) and one flying over Herrriot's Pool at Chew Valley Lake (5758) on 6 November (BL).

Serotine ***Eptesicus serotinus (0,2,2,0,0)***
No records for the year.

Noctule ***Nyctalus noctula (4,4,4,3,1)***
Records from Grebe Pond, Northwick (5586) - 4 seen hunting over pond on 4 September (BL); Sneyd Park Nature Reserve (5575) – up to 3 seen foraging May/July (ED); Aust Warth (5688) – 1 seen on 14 October (BL); Dundry (5666) – 2 seen flying above road and hedges on 25 June (ED).

Leisler's Bat ***Nyctalus leisleri (0,0,0,1,0)***
No records for the year.

Common Pipistrelle ***Pipistrellus pipistrellus*** **and Soprano Pipistrelle** ***Pipistrellus pygmaeus (6,5,12,4+,3)***
Recorded between May and September from the following 1-km squares:- Easton-in-Gordano (5175) – up to 30 in a bungalow roof in August (DT); Chew Valley Lake (5658) – one hanging from roof of fisherman's hut by the gate to the Stratford Hide on 4 May (S&JP); and flight records from 5575, 5684, 6069, 6271.

Records from ED, S&JP, JR, DT.

Nathusius' Pipistrelle Pipistrellus nathusii (0,0,0, 1,0)
No records for the year.

Brown Long-Eared Bat ***Plecotus auritus (0,1,1,0,0)***
No records for the year.

Bat Studies at Bristol University

Research at the University of Bristol (Wickramasinghe et al 2004) has shown that many British bat species may prefer to forage on insects on organic farms rather than conventional farms. Bat activity was found to be 61% higher on 24 organic farms in England and Wales than on 24 matched conventional farms. Insect abundance, species richness and moth diversity were also significantly higher on organic farms. Their observations suggest that agricultural intensification has a profound impact on nocturnal insect communities. Less-intensive farming benefits British bat populations by

providing and maintaining diverse and structurally varied habitats, which in turn provide a wide selection of insect prey for bats, including insect families that are significant components of the diet of a number of rare bat species.

LAGOMORPHA (Rabbits and Hares)

Brown (European) Hare *Lepus europaeus (6,24,10,11,34)*
Records from the following 1-km squares: 5864, 6464, 6563, 6864, 7275, 7476.
Two adults seen in arable farmland at Norton Hawkfield (5864) on 22 May; 2 seen on recently ploughed field at Compton Common (6464) on 21 April; 3 seen in mixed farmland at Tucking Mill (6563) on 12 April; 2 seen chasing over fields at Stanton Prior (6864) on 16 March; single hares seen at Lower Ledge Farm (7275) in 14 April and at Hinton Hill (7476) on 4 August.
Recorded by PJC, PGF, S&JP.

The Dorset Wildlife Trust 'Tracking the Dorset Hare' project received an impressive 1,317 sighting records from 500 recorders. Hares had re-colonised some areas and there has not been a significant contraction in the overall range for brown hares in Dorset. This information will be used to help farmland wildlife advisers with the Wildlife Trust and those with the Dorset Farming and Wildlife Advisory Group and other organisations target resources *(such as the new Defra Environmental Stewardship scheme launched in March 2005 - DPCT)* at the areas supporting core populations of hares. (Wildlife Reports *British Wildlife* **15** (4) April 2004).

A three-year study of brown hares in the Pawlett Hams area north west of Bridgwater between 2000 and 2002 revealed a considerable amount of information on the habitat requirements of this species (Smith *et al* 2004). Hares were cage-trapped and fitted with radio collars and their movements and habitat use were recorded. Mean home range size was 34 ha, with large ranges in the winter and spring. Hares selected fallow land and pasture grazed by cattle in preference to arable crops throughout the year, except during the winter when crops were suitable as forage. Pasture grazed by sheep was avoided in all seasons but winter. Hares were found to select habitats with taller vegetation during the spring and summer. Many of the habitats selected were heterogeneous in structure mainly due to cattle

grazing and hares avoided short homogeneous vegetation in all seasons. They conclude by stating *'Increasing habitat heterogeneity at the farm scale may benefit hares, especially in highly homogeneous, intensively managed landscapes. However, managers of pastural farmland should aim to increase habitat heterogeneity at the within-habitat (or within field) scale in particular, to provide better cover throughout the year. Agri-environment schemes should target the regeneration of heterogeneity in pastural landscapes, by encouraging changes such as an increase in fallow land and a reducing in livestock diversity. Such shifts in management are likely to benefit both hares and farmland biodiversity in general.'*

Rabbit *Oryctolagus cuniculus (68,52,36,19,105)*
Records from the following 1-km squares: 3561, 4465, 4466, 4566, 4673, 4665, 4666, 4677, 4759, 4761, 4872, 4861, 4868, 4873, 4874, 4964, 5063, 5069, 5072, 5170, 5266, 5280, 5382, 5371, 5378, 5379, 5380, 5383, 5472, 5473, 5478, 5479, 5485, 5584, 5568, 5555, 5586, 5584, 5658, 5683, 5669, 5671, 5672, 5679, 5769, 5779, 5780, 5781, 5862, 5988, 6176, 6184, 6285, 6369, 6371, 6380, 6479, 6583, 6684, 6780, 6767, 7272, 7577, 7677, 7685, 7863, 7968, 7974.
Recorded by RLB, PJC, EN, S&JP, JR, DT, DWa.

RODENTIA (rats, mice, voles and squirrels)

Brown Rat *Rattus norvegicus (9,9,13,6+,17)*
Records from the following 1-km squares: 5385, 5585, 5683, 5777, 5781, 5782, 6069, 6071, 7559.

Recorded by BL, JR.

Grey Squirrel *Sciurus carolinensis (62,59,37,50,77)*
Records from the following 1-km squares: 4170, 4469, 4569, 4570, 4566, 4668, 4677, 4769, 4777, 4870, 4971, 4972, 5170, 5271, 5272, 5372, 5373, 5377, 5471, 5473, 5476, 5477, 5585, 5572, 5573, 5577, 5579, 5669, 5675, 5676, 5677, 5673, 5678, 5685, 5769, 5772, 5776, 5777, 5778, 5779, 5781, 5873, 5874, 5978, 5979, 6071, 6170, 6175, 6176, 6178, 6268, 6269, 6271, 6272, 6273, 6275, 6276, 6280, 6371, 6376, 6477, 6584.

Recorded by RLB, JFB, EN, JR, S&JP, DT, MT.

Water Vole *Arvicola terrestris (1,2,2,2,0)*
One seen swimming in a ditch at Avonmouth (5379) in May (RLB).

Local Water Vole News
Following the successful release of 70 water voles at Royal Portbury Dock last year, a second group of 83 voles were released at a new site at the docks on 30 June. The voles had been bred in captivity at Bristol Zoo from the original group of animals rescued from the wild more than five years previously (*Bristol Evening Post* 30 June 2004).

Bank Vole ***Clethrionomys glareolus (1,5,6,1,4)***
One record from West End Nailsea (4569) – one seen at bird table (DT).

Short-tailed Field Vole ***Microtus agrestis (1,5,7,2,2)***
One record from a Pilning garden (5585) (JR).

Harvest Mouse ***Micromys minutus (0,0,0,1,0)***
No records for the year.

Common Dormouse ***Muscardinus avellanarius (0,1,1,0,?)***
No records for the year.

Michael Woods reported on the South West Dormouse Project using dormouse 'tubes' (devised by Dr Pat Morris as a method of detecting the presence of dormice in non-typical habitats). Nearly 2000 dormouse 'tubes' made from corrugated plastic were put in place in March 2004 in a variety of habitats in Avon, Somerset, Dorset, Devon and Cornwall. Dormice, or their nests, were recorded in 32 of the 117 sites in every month from April through to November, with peaks in May and September. Dormice were found in a range of 'scrub' habitats including two sites where the cover was described as 'light' (<25%). One 'scrub' site was almost pure gorse! Dormice were found in a wide range of hedges, from the wide unmanaged species-rich hedges (where they were expected) to 'a tightly flailed 1m metre wide, 1.5 metre high hedge'. Dormice were found in 50% of the conifer plantations and only 20% of deciduous woodlands (perhaps they could not find many natural nest sites in the conifer plantations). Dormice were found at two 'Culm grassland' sites and at one site in an area of heathland adjacent to a scrubland site. The results of the survey confirm the recent view that dormice are found in a much wider range of habitats than just species rich woodland and hedegrows. Indeed recent records in Somerset indicate that dormouse nests are being found increasingly frequently in clumps of pendulous sedge *Carex pendula* growing in woodland rides and damp corners (*Mammal News* **137** Spring 2004).

Wood Mouse (Long-tailed Field Mouse) ***Apodemus sylvaticus (3,9,5,7,6)***
Records from the following 1-km squares:- 4673, 5572, 5770.
Wood mice were caught regularly in *Longworth* traps at Clapton Moor Nature Reserve (4673) in March and September.
Recorded by JFB, J&DM, DT.

House Mouse ***Mus domesticus (1,3,1,4,3)***
Several records from a large rural garden in Pilning (5585) (JR).

Yellow-necked Mouse ***Apodemus flavicollis (0,0,1,0,0)***
No records for the year.

CETACEA (whales, dolphins and porpoises) and PINNIPEDIA (seals)

Harbour Porpoise ***Phocoena phocoena (1,0,0,0,0)***
One seen off the sea wall at Severn Beach (5384) on 27 November (PB).

Grey Seal ***Halichoerus grypus (0,0,1?,0,0)***
No records for the year.

CARNIVORA (carnivores)

American Mink ***Mustela vison (1,0,2,0,3)***
A single mink seen hunting along river bank on the River Chew (5762) on 27 January (DWa). Simon Reece reports seeing very few signs of mink and very few animals during the 2004 otter surveys (*Bristol Avon Otter Survey* March 2005).

Stoat ***Mustela ermina (0,1,3,4,10)***
No records for the year.

Weasel ***Mustela nivalis (4,6,7,3,10)***
Records from the following 1-km squares:- 5054, 5476, 5477, 5657.
All records were of individuals apart from Kings Weston (5477) – 2 'playing' in middle of road on 5 July.
Recorded by ED, DWa.

European Polecat ***Mustela putorius*** **(0,0,2,2,?)**
No records for the year.

The Mammal Society and Vincent Wildlife Trust (VWT) launched a three-year Polecat distribution survey of Britain starting in January 2004. The aim is to confirm the presence in as many 10km squares as possible over the three year survey period and it is expected to confirm a significant expansion in the Polecat's range since the last survey finished in 1997. Further details about the survey can be found on the VWT web-site at www.vwt.org.uk (*Mammal News* **136** Winter 2003-2004). By the end of May 2004, some 83 fresh specimens had been examined from 70 10km squares. Pure polecats were collected from 10km squares ST59, ST86, ST87 all of which include parts of South Gloucestershire. (*Mammal News* **138** Summer 2004).

Otter *Lutra lutra (28+,19+,25,2+,24)*

Otters in North Somerset

The North Somerset Otter Group undertook regular surveys of the watercourses in North Somerset in 2004. The 24/25 April survey revealed positive signs of at least three otters in the area – fresh spraint at Perry Bridge on the Congresbury Yeo, on the Land Yeo at Flax Bourton and on Uphill Great Rhyne. Older but still recent spraint was seen on the Blind Yeo in Clevedon, the River Kenn near Midgell Farm and the Middle Yeo at Tickenham Moor (*NSOG Newsletter* Issue 16, Spring 2004). The August 11/12 survey revealed the presence of otters on the River Ken at Midgell Farm, the Land Yeo west of Nailsea, the Middle Yeo on Tickenham Moor, the Congresbury Yeo and the Oldbridge River on Puxton Moor (*NSOG Newsletter* Issue 17, Summer 2004).

Otters on the Bristol Avon in 2004

Otters continue to do well on the Bristol Avon and its tributaries with positive signs, sightings etc from the following locations (information summarised from the *Bristol Avon Otter Survey* report for March 2005 by Simon Reece).

Bristol Frome*

Frenchay (6477) – spraint.

By Brook

Fountain Wood weir (8475) – spraints; Common Hill weir (8374) – spraints and padding; Drewitts Mill (8369) – spraints; Box Mill/Box Water Garden (8268) – spraints; Middle Hill Gauge (8168) – spraints; Shockerwick Bridge (8068) – spraint.

Corston Brook*
Upper Lake (6964) – spraint; A4 Road Bridge (6965) – spraints; Railway bridge (7065) – spraints.

Mells Stream
Edford Wood (6648) – spraints; Mells Bridge (7248) – spraints; Mells Pond (7348) – spraints.

River Avon*
A46 bridge and saddle (7666) – spraints, padding and digging; Boat House Road Bridge (7165) – spraints; Kelston Park (7065) – spraints; Lockkeeper, Keynsham (6569) – spraints.

River Boyd*
Old Mill Weir (6871) – spraints.

River Chew*
Coley Reservoir (5855) – spraints; Shrow Bridge (5756) – spraints; Hollow Brook Junction Pool (5960) – spraints; Denny Lane and Flume (5761) – spraints and padding; Stanton Drew Bridge (5963) – spraint, padding and digging; Bye Mills (6163) – spraints and padding; Publow Bridge (6264) – spraints; Old Bridge and Weir (6464) – spraints; Woollard Bridge (6364) – spraints and SIGHTING.

River Frome
Spring gardens (7749) – spraints, padding and diggings; Old Ford (7850) – spraint; Langham Farm Weir (8054) – spraints; Tellisford Bridge (8055) – spraint; Snarlton Farm (8157) – padding.

Sherston Avon
Cowage farm (9083) – spraint.

Wellow Brook*
Upper Weir (7357) – spraint; Middle and Lower Weir (7357) – spraint; Bridle and Sleeper Bridges (5859) – spraint.

* = Rivers in the old county of Avon.

There have been regular sightings of otters during the year; at Ford on the upper reaches of the River Chew (5953); on 10 October at Chew Valley Lake (5658); at Wellow (7458) on 9 October; several times on the main river in Bath (Bathampton weir to downstream of Bath city centre); two

together on the Somerset Frome at Iford. Road casualties were reported from the Bathampton bypass (thought to be a small young bitch in March/April) and from near Chippenham on 28 November (a large otter).

Badger *Meles meles (37,31,50,42,77)*
Records of road casualty badgers from the following 1-km squares: 3762(2), 4169(2), 4170, 4271, 4464, 4469, 4570, 4972, 5269(2), 5365, 5457, 5570, 5571, 5579, 5581, 5587, 5661, 5782, 6256, 6285, 6286, 6455, 7659, 7680.

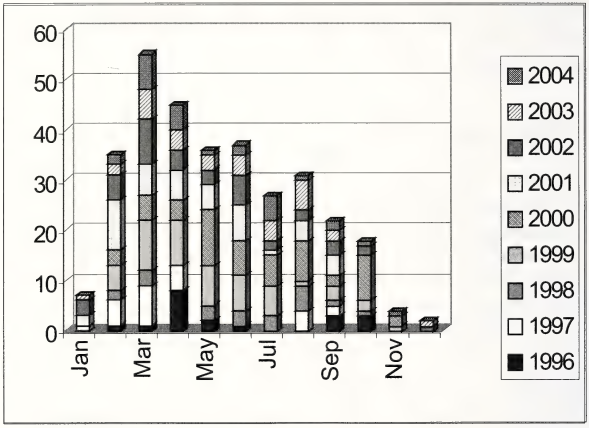


Figure 2. Number of Badger Road Casualty Records 1996-2004

Nine years of Badger road casualty figures with 319 records to date show a large peak around March/April (peak breeding season) with a smaller peak in August (dispersal of young) (Fig 2). There are few records between November and January. This is the time of year when Badgers are at their least active with the pregnant females underground in their setts prior to giving birth to cubs between January and March.
Since records of road casualty badgers were recorded on a regular basis (from 1996), a number of 'hot-spots' are apparent. 1-km squares with 3 or more road casualty badgers area as follows:-

1–km square	Number of road casualty badgers	Location/Notes
ST4169	3	M5 near Clevedon (the overbridge at

		ST414699 appears to be particularly hazardous)
ST4170	4	M5 junction 20 (Clevedon)
ST4271	9	M5 near Clevedon Court
ST4673	3	M5 near Clapton Court
ST4971	3	B3130 Wraxall
ST4972	4	B3128 Wraxall
ST5072	3	B3128 Wraxall
ST5269	6	A370 Cambridge Batch (Long Ashton Bypass)
ST5369	7	A370 Barrow Wood (Long Ashton Bypass)
ST5469	3	A370 Long Ashton (bypass)
ST5472	4	B3129 Ashton Court/Beggar Bush Lane
ST5484	5	A403/M49 Severn Beach
ST5570	3	A370 Long Ashton (bypass)
ST5571	4	A370/B3128 Long Ashton (bypass)
ST6469	5	A4 Keynsham Bypass
ST7172	3	A420 Wick
ST7476	4	A46 Dyrham Park
ST7757	3	B3110 Hinton Charterhouse
ST7775	3	Minor road near West Littleton
A further 46 1-km squares had 2 road casualty badgers and 133 1-km squares had 1 road casualty badger.		

The results give an indication of the most hazardous places for badgers (and for road users) but are likely to be biased towards the routes driven by the regular badger road casualty recorders. This is particularly true of the roads around Nailsea, the M5 and the A370 where your county mammal recorder lives. Never-the-less, 21 badger road casualties along a 5-km stretch of the A370 between Cambridge Batch and Bower Ashton in 9 years is something that the Highways Authority may need to consider taking action over. The erection of badger-proof fencing along the road verges or the construction of badger (and over wildlife under or over passes) could be considered.

Road Name/Number	*Location*	*Number of road casualties in 2004*
Minor roads	Various	9
A370	Ashton Gate to East Brent	5
B3130	Pensford to Clevedon	3
M5	Falfield to Loxton	1
M4	Tormarton to Second Severn Crossing	1
A37	Temple Meads to	1

	Farrington Gurney	
A38	Falfield to Churchill	1
A46	Starveall to Bathampton	1
A362	Farrington Gurney to Radstock	1
A368	Banwell to Marksbury	1
A403	Avonmouth to Aust	1
B3110	Bath to Hinton Charterhouse	1
B4055	Shirehampton to Pilning	1

Other badger records as follows:- Dung pits alongside roadside hedge at Clapton Moor Reserve (4673); setts recorded at Tyntesfield (4971), Ashton Hill Plantation (5270), Avonmouth (5378), Beggars Bush playing fields (5473), Berwick (5580), Canford (5677), St George (6273), Wick (7072); diggings/scrapes seen at Stoke Bishop (5676); up to 10 seen regularly in a garden in Pilning (5585), regular sightings in Moorgrove Wood, Henbury (5578) and a record of badgers killing caged hamsters at Arnos Vale (6071).
Recorded by:- RLB, ED, BL, J&DM, JR, E&MT, DT, MT.

Jeff Rawlinson once again reports on the nocturnal activities of badgers in a large rural garden at Pilning (5585). The first juvenile badger was seen on 25 May. A very small youngster was observed on 26 June. An amazing 14 badgers were seen in the garden at 22.02 hrs on 17 July. Figure 3 summarises the numbers of badgers seen in his garden throughout 2004.

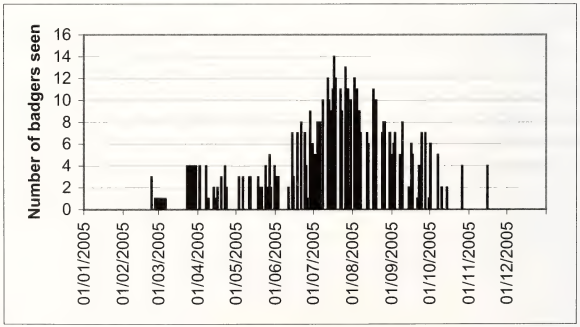


Figure 3. Numbers of badgers seen in a Pilning garden in 2004

An independent survey has highlighted that the culling trials of badgers due to their possible role in transmitting TB has not been successful. The report states that the trial may not be complete before 2008 which is twice as long as originally planned. The number of cattle herds infected with bovine TB has risen despite the trial. Interpretation of early results suggest that "Reactive" culling is said to have led to a rise of 27% in herd infections, yet this could also be a result of chance. *(BBC Wildlife* ***22*** *(6) June 2004).*

Whilst clearing out some drawers in an old cupboard, I came across a fascinating article in the *Bristol Evening Post* of Thursday 27 August 1959, entitled 'Unique picture is boy's reward for three late nights'. Robert Baker, a 13-year old school boy from Canford Lane, Westbury-on-Trym, saved up 8 months pocket money and bought a camera costing 55 shillings. With flashlight equipment bought by his mother, he managed to take a picture of a badger in his garden late one night. A family of badgers had been visiting the Bakers' garden regularly for the previous five years, attracted by breadcrumbs put out to attract the birds and bread, milk and cheese to attract the badgers. Mrs Baker thought that the badgers come from Henbury Golf Course behind their home. Mr R E Greed, the then director of Bristol Zoo, said 'It is quite unusual for badgers – normally shy nocturnal creatures – to frequent houses. They do however make very good pets'. The same paper had an interesting football score line 'Liverpool 4 : Bristol City 2' – no change there then!

Fox ***Vulpes vulpes (38,48,39,35,71)***

Records of Foxes found dead on the road in the following 1-km squares (* = Foxes found within the 'Bristol' boundaries): 4773, 5164, 5279*, 5382*, 5369, 5383, 5484(2), 5472, 5585, 5579(2)*, 5657, 5981, 6083, 6578, 7470, 7681.

Live foxes were seen in the following 1-km squares: 4569, 4770, 5378*, 5476*, 5481, 5484, 5479*, 5585, 5575*, 5684, 5778*, 5777*, 5781, 5876*, 5974*, 5975*, 6071*, 6075*, 6165, 6170*, 6260, 6975, 6986, 7884.

Jeff Rawlinson reports on the foxes living in a large rural garden in Pilning (5575). Foxes (almost always individual animals) were seen in every month except February (signs only) and December. On a number of occasions foxes were seen at the same time as groups of up to 10 badgers. On several occasions a large dog fox (the same individual?) was seen to run onto the lawn 'barking' unsettling any badgers present (up to 10) which then scattered allowing the fox time to feed. A large juvenile (vixen?) possibly

with mange, spent several hours in the garden during the day on 8 September.

Recorded by:- RLB, JFB, PJC, ED, PGF, HM, MM, LM, S&JP, CR, JR, MS, CT, DT, MT, RW, JW.

ARTIODACTYLA (deer)

Red Deer ***Cervus elaphus (XX,0,1,0,1)***
No records for the year outside deer parks.

Roe Deer ***Capreolus capreolus (26,33,27,20+,51)***
Records from the following 1-km squares: 4272, 4475, 4572, 4677, 4758, 4865, 4875, 5070, 5072, 5169, 5269, 5276, 5372, 5373, 5476, 5655, 5659, 5660, 5864, 5858, 6369, 6564, 6864, 7167, 7774, 7974.
The largest groups of deer seen during the year were of 3 does and 2 fawns seen at East Wood (4677) on 19 June, 1 buck and 3 does seen at Mendip Lodge Wood (4758) on 24 May, 4 seen at Failand (5372) on 9 April, 5 does seen at Sutton Hill (5958) on 8 April and up to 5 seen at Nunnery Point CVL (5659) throughout the year. Most other sightings were of single animals. Two road casualty deer were recorded, at Failand (5072) on 11 October and on the A370 at Cambridge Batch (5269) on 24 November.

Recorded by RLB, PJC, ED, PGF, EN, HP, S&JP, DT, MT, DWa.

Fallow Deer ***Dama dama*** **(1,1,0,0,0)**
A group of 9 animals including a buck with a fine set of antlers in field below railway line at Bitton (6769) (S&JP).

Chinese Muntjac Deer ***Muntiacus reevesi (3,1,?1,0)***
No records for the year.

CONSERVATION

In February 2004 Network Rail informed locals that woodland surrounding both sides of the track for 2-km in the area of Coalpit Heath and Winterbourne was to be felled. Due to the public outcry the work was postponed. The council put tree preservation orders on all of the trees and surveys have suggested the presence of both dormice and noctule bats. Network Rail states that the work must go ahead to stabilise the embankment but that bat and dormouse surveys will be carried out to

determine the action required before work can start. *(BBC Wildlife* ***22*** *(5) May 2004).*

The State of Britain's Mammals 2004

This third update reported on biodiversity action plans (BAP) and other matters (Macdonald and Tattersall 2004). The report highlighted the threats to Britain's three most threatened mammal species, Water Vole, Red Squirrel and Scottish Wildcat. Whilst there may well be a future for the water vole with a combination of mink control and habitat management, the red squirrel, threatened by the spread of grey squirrels and associated outbreaks of parapoxvirus, seems likely to become extinct in England, Wales and southern Scotland. Scottish wild cats are now critically endangered having bred extensively with feral domestic cats and their legal protection is jeopardised by uncertainty over their definition and identification. As yet they are not even a priority for the BAP process. Two other BAP species, pipistrelle bats and particularly otters appear to be faring much better. For pipistrelles all 12 species action plan (SAP) have been enacted and 18 of 20 actions in the otter SAP have been enacted. In England otters have shown a five-fold increase in signs recorded at survey sites between the first national survey in 1977-79 and the fourth survey in 2000-02.

NATIONAL MAMMAL SURVEYS

The Mammals Trust UK ((www.mtuk.org.uk) undertook two wide-ranging surveys in 2004. The ***Living with Mammals Survey*** was a repeat of the 2003 survey in which participants were asked to record mammals in their gardens, urban parks, churchyards, derelict land, allotments, golf courses etc. in the months of April, May and June. Almost 900 people took part in the 2003 survey and 24 different species of mammals were reported. Grey squirrels were the most frequently reported species, being present at 68% of sites. 56% recorded the presence of mice, voles or shrews and 42% of surveyors noted the presence of bats. 1 in 7 sites were visited by deer and rarer species including water voles, brown hares, red squirrels and common (hazel) dormice were seen at 40 of the sites. The ***Mammals on Roads Survey***, which began in 2001 as the National Hedgehog Survey, asked people to record mammals (both dead and alive) on car journeys between July and September. In the first two years of the survey over 180,000 miles of roads were surveyed and 21,000 mammals recorded. Half the terrestrial mammal species in the UK have been recorded so far, with rabbits accounting for about 50% of the sightings. It is estimated that between 30,000 and 50,000 deer and a similar number of badgers are killed on the roads of the UK each year. The survey hopes to greatly increase our

knowledge of the abundance and distribution of mammals throughout the UK.

The ***Winter Mammal Monitoring Project*** run by the Mammal Society and the British Trust for Ornithology started its third year in November 2003. A total of 23 mammal species were seen during the 2002/03 season. The most commonly recorded species being rabbit, grey squirrel, fox and roe deer. Regional and habitat distribution patterns were similar to that of the first year of the survey. Foxes appeared to be the only truly generalist species, being found evenly across all regions and habitats. Brown hares were most frequently observed in northern and eastern England, favouring arable and pastoral areas. Grey squirrels were most frequently seen in the north and south-east from urban and woodland habitats. Muntjac were restricted to sites in eastern England as were fallow deer, with a few sightings from western England and Wales (Wildlife Reports *British Wildlife* **15** (3) February 2004).

As part of the British Trust for Ornithology ***Garden BirdWatch project*** recorders were asked to record species other than birds that were seen using their gardens (*Bird Table* **40** Winter 2004). The pilot survey, run in 2003, asked participants to record mammals using their gardens. Well over 5,000 Garden BirdWatchers took part in the survey. As expected 'rural' gardens had higher reporting rates for virtually all mammal species (except hedgehogs and foxes) compared to suburban and urban gardens. Initial results suggest that 40% of urban gardens are visited by foxes. Perhaps surprisingly hedgehogs were recorded in every month of the year, although activity between December and February was very low. The results of the survey are summarised in the table below:-

Species	*Rural*	*Suburban*	*Urban*
Hedgehog	40.7%	46.2%	33.7%
Mole	44.6%	7.0%	3.7%
Common Shrew	25.5%	4.6%	3.1%
Rabbit	42.7%	7.2%	2.5%
Brown Hare	6.3%	<1.0%	<1.0%
Red Squirrel	4.5%	1.3%	<1.0%
Grey Squirrel	72.3%	79.6%	75.5%
Wood Mouse	34.0%	29.1%	18.4%
Brown Rat	34.8%	18.8%	16.6%
Edible Dormouse	1.1%	<1.0%	<1.0%
Red Fox	33.8%	34.0%	39.3%
Pine Marten	<1.0%	<1.0%	<1.0%
Badger	16.1%	6.5%	5.5%
Roe deer	8.8%	2.0%	<1.0%
Muntjac	7.2%	2.4%	<1.0%

SURVEY TECHNIQUES FOR MONITORING MAMMALS

Mammal Review devoted an entire issue (Vol 34 nos 1 & 2 for 2004) to a series of papers on survey techniques for monitoring mammals. Battersby and Greenwood (2004) summarised the background to the setting up of the Tracking Mammals Partnership - a monitoring network for UK terrestrial mammals. Flowerdew *et al* 2004) reviewed the small mammal monitoring programmes from Britain, the two most extensive being the Mammal Society National Woodland Small Rodent Survey (1982-1995) and the ADAS Hedgerow Survey (1983-1992). Other surveys include H.N. Southern's Wytham Wood Index Survey (1049 to date) and the Mammal Society Field Vole Survey (1995-97). They suggest that future small mammal monitoring will need to take an integrated approach in which information from direct and indirect monitoring is linked with broad-scale data on changes in habitat availability. Other papers include monitoring of grey and red squirrel populations using visual counts along line transects, hair tubes, drey counts, cone line feeding transects and feeding signs on whole maize bait at feeding stations (Gurnell *et al* 2004), methods of monitoring foxes and badgers by field signs (Sadlier *et al* 2004), the imprecise science of monitoring woodland deer populations (Smart *et al* 2004), monitoring mammal population changes using counts of road traffic casualties (Baker *et al* 2004) and monitoring cetaceans around Europe (Evans and Hammond 2004).

LEGISLATION

The **Hunting Act 2004** which came into effect at midnight on 17 February 2005, bans the hunting with dogs of all wild mammals, and all hare coursing. Its intention is to end a practice that many people feel causes unnecessary suffering to animals. There are some tightly drawn exemptions to the Act, which allow hunting activities to take place in limited circumstances and with the consent of the occupier or owner of the land, such as:

ratting and rabbiting;

stalking and flushing out with up to two dogs; and

using a single dog under ground to flush out wild mammals, such as foxes, in order to protect birds kept for shooting.

A person found guilty of an offence under the Act faces a fine of up to £5,000, and could have their dogs, vehicles or articles used in hunting confiscated.

Wildlife and Countryside Act 1981. Following the publication of the Rural White Paper 'Our countryside; Our Future', the Government were required to 'review…..the provisions of Part 1 of the Wildlife and Countryside Act 1981 with a view to rationalising the identification and protection of rare and endangered species and …. bring forward amending

legislation where necessary and where Parliamentary time permits'. Of particular mammal interest were the following proposals:-

- Proposal H:- to make it an offence to possess or sell European protected animal species illegally taken from the wild in EU member states.
- Proposal J:- to allow the issuing of a general licence to allow the temporary taking of a Schedule 5 species in the living area of a house for the sole purpose of releasing it back into the wild at the same site. For example at present it is an offence to catch a bat found in the living space of a house for immediate release outside.
- Proposal L:- to make it an offence whilst any snare or trap remains set in position, to fail without reasonable excuse to inspect it, or cause it to be inspected, at least once every day at intervals of not more than 24 hours, taking into account the stress tolerance of the target animal, its vulnerability to the prevailing weather, and access by predators.

Responses to the consultation were required by 24 March 2005.

EXOTICS/BEASTS

Reports of large cats/panthers/leopards etc roaming the countryside continue to circulate in the press but as yet there have been no confirmed sightings.

Charlie Wilson asked the question 'Could we live with reintroduced large carnivores in the UK?' (Wilson 2004). Literature on the wolf *Canis lupus*, brown bear *Ursus arctos* and lynx *Lynx lynx* indicate that only the Scottish highlands could support potentially viable populations of these species with their large home ranges and low population densities. The highlands also have a relatively low human population and relatively high wild ungulate (principally red deer) density. The general public are generally favourable to species re-introductions and to carnivores, but are not supported by those most likely to be adversely affected such as livestock farmers. He concludes that the re-introduction of the lynx may be feasible but that habitat sustainability and the potential impact on vulnerable native wildlife needs to be assessed. Socio-economic and legal issues also need to be addressed before such a re-introduction can be considered.

The Wild Boar *Sus scrofa* population in Dorset still survives despite a number being hit by vehicles and others being shot by farmers and landowners (Charlie Wilson pers. comm.). There were rumours of a group of wild boar having escaped from a farm in the Symond's Yat area of the

Forest of Dean (notices seen at the Symond's Yat Forestry Commission car park).

LUNDY in the 1950s

The official guide to Lundy by F.W. Gade from c 1957 had an interesting section on the mammals found on the island in the Bristol Channel. 'The list of mammals is short. The Atlantic Grey Seal haunts the shores in increasing numbers, and some breed. The only known breeding place ins the Seal's Hole on the south coast, a sea cave 100 yards long terminating in a gravel floored chamber 60 feet high, which is not touched by the tide. The last census of seals gave a population of over 80. Rabbits are numerous, though not so plentiful as 20 to 30 years ago. The black rabbits among them are not the result of introduction of tame rabbits, but melanistic types due to inbreeding. Both brown and black rats are fairly plentiful, especially the former, and the list is completed by a large population of pigmy shrews. Mr M.C. Harman, a keen naturalist, introduced three kinds of deer in 1927, red, fallow and Japanese Sika. The two former are now extinct, but the Sika deer thrive and number between 50 and 60.'

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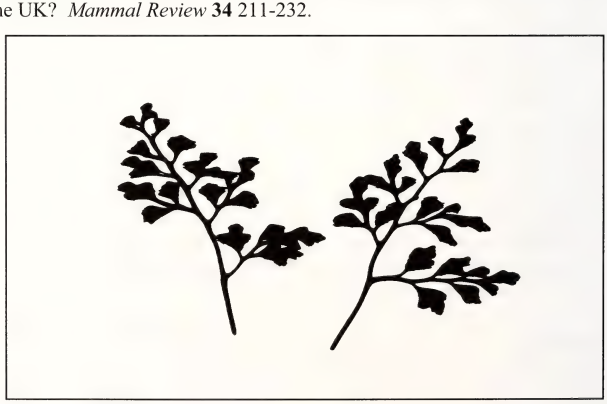

Bristol region Invertebrate Report, 2003

R. J. Barnett
City Museum, Queens Rd BS8 1RL
E-mail: ray_barnett@bristol-city.gov.uk

INTRODUCTION

The publication of the *Butterflies of the Bristol region* in July was an important event as it placed in the public arena the results of the Avon Butterfly Project. The Project has collected data on our species since the beginning of the 1990s. The results, coupled with the summary of the historic status of our butterflies, are somewhat depressing. The extinction from the "Avon" area of the Duke of Burgundy, Pearl-bordered Fritillary, Marsh Fritillary and Glanville Fritillary (the latter an introduced, but well established colony) since the start of the Avon Butterfly Project should raise alarm bells as to the fate of other species which are now declining in the region. Of these, the Chalkhill Blue, Small Blue, Small Pearl-bordered Fritillary and Grayling are of great concern and coupled with the Brown Hairstreak, Grizzled and Dingy Skippers are now the species identified as in need of special attention by those with responsibility for sites where they still occur. The species listings below include records of Marsh and Glanville Fritillaries which apparently contradicts the findings of the Project that these species have disappeared. In fact the Marsh Fritillary was lost several years ago and these sightings represent the introduced colony which may just be clinging on at Folly Farm with regular searches only turning up a couple of individuals. The Glanville sighting is intriguing as it has not been seen at its Sand Point location and although the individual seen could have come from there perhaps it could also represent recently released stock?

As regards other butterfly sightings during 2003, it was an unexceptional year. Activity of our over-wintering species began in earnest around the 22 February. Later in the year, vanessids, such as the Small Tortoiseshell, seemed to be present in good numbers which is good news following some concerns in previous years over the abundance (or lack of) of some of the commoner butterflies. Despite it being an interesting year for immigrant moths, the only immigrant butterflies very much in evidence were Painted Ladies and a relatively small number of Clouded Yellows.

Once the the butterfly book was completed, work increased on its companion volume the *Moths of the Bristol region*. This is an altogether bigger project given the 1,500+ species that have been recorded in the last

two hundred years. The Bristol & District Moth Group continued to hold light trapping meetings from spring to autumn and to encourage individuals to take up recording of moths. The greatest gaps of knowledge remain in the smaller species and particularly where recording is best achieved by identifying larval mines and the larvae themselves. Historical research on the moths, in particular of records by previous members of the Bristol Naturalists' Society, has identified various species to search for in the remaining months before publication is expected, hopefully in 2005. Best records during 2003 include the Small Marbled, recorded at the moth trap of Bill Dixon, near Portishead. The appearance of this immigrant (only the second ever noted in the "Avon" area) reflects the excellent year this was for other immigrants especially the Humming-bird Hawk-moth and the Convolvulus Hawk-moth. Larvae of the latter species were reported as well as larvae of the Death's Head Hawk-moth, always a spectacular species to witness. A foreign species which appeared in Somerset due to the international trade in garden and house plants was a Saddle-back Moth. 10 larvae were discovered on a plant thought to have been imported from the Netherlands, but of North American origin, and came to notice as the larvae have hairs which irritate human skin.

Of other insect groups, the expansion in range of the Long-winged Cone-head seems to continue a pace and it can now be expected to be found throughout our district. I am particularly grateful to Robert Cropper for his records of this species and other orthoptera. Another example of a species probably expanding its native range is the Box Bug, *Gonocerus acuteangulatus*, which appeared in Bristol and presumably has adapted to feeding on box in gardens and plant nurseries. These sources of foodplants are thought to explain the spread of other species such as the Juniper Shieldbug. Aside from the Hummingbird Hawk-moths and Convolvulus Hawk-moths, an unconfirmed sighting of one other interesting migrant was a possible Lesser Emperor Dragonfly at Chew Valley Lake, sadly not seen long enough for its identity to be assured. The summer of 2003 was particularly hot and this may account for an apparent increase in the number of sightings of the large hoverfly *Volucella zonaria* in and around Bristol and even in Burnham, as well as sightings of the rarer but closely related species in our district, *Volucella inanis*. The latter reflects the national increase of this species following a retreat into the south east of England around the 1960s (Morris & Ball, 2003).

My thanks to all who have contributed to this report but also to those who submitted records which do not appear, these still contribute significantly to building up a picture of our invertebrate fauna, particularly in monitoring our commoner species but whose status can change so easily. Thanks also

to the Bristol Regional Environmental Records Centre (BRERC) and contributors to the Bristol Wildlife e-group for supplying other data.

Scientific nomenclature follows the names given in Bradley (2000), Chandler (1998) and Potts (1964).

Species of note in 2003

INSECTA

DERMAPTERA

Labia minor (L.) **Lesser Earwig** Several found in a dung heap on Westhay Moor ST459 448 (vc6) 19 October 2003 Robert Cropper, the second record for this 10km square for this increasing, but easily missed, species.

Forficula lesnei L. **Lesne's Earwig** Another increasing but overlooked species, small numbers were recorded in two separate hedgerows near Keinton Mandeville ST550 299 and ST550 301 (vc6) 13 September 2003 Robert Cropper. (The latter record is the first known for ST53.)

ORTHOPTERA

Conocephalus discolor (Thunb.) **Long-winged Conehead** Well distributed in ST66 (vc6) with all the following records by Robert Cropper on 10 August 2003: good numbers along the eastern verge of the B3116 near Burnett ST666 646, at least one male in rough field at Saltford ST674 464, several in a rough field near Church Farm at Corston ST692 653, colony in a rough field near the road at Stantonbury Hill ST679 636, a single male just north at ST679 640. Other reports of this species by Robert Cropper in vice-county 6 are: a large colony in a rough field at Draycott ST478 512 11 August 2003, near an old railway line ST470 512 16 August 2003 (first records for this 10km square), a stridulating male at Pendon Hill, Stawell ST359 380 and another in a field east of the village at ST374 384 20 September 2003 (new 10 km squares), stridulating males on the road verge at Dulcote ST562 445 and on a field border at Worminster Sleight ST566 426, plus a colony at Stoodly Hill ST581 418 in a field 27 September (new 10km square records), two stridulating males near Tin Bridge Roundabout, Glastonbury ST511 404 and one on the verge of the bypass at ST495 393 1 October 2003.

HEMIPTERA

Gonocerus acuteangulatus (Goeze) **Box Bug** Clifton, Bristol ST581 733 (vc34) 6 August 2003 Sam Trebilcock, det. Martin Evans. First record in

the area of this local species, apparently expanding its national range by utilizing garden food plants.

Reduvius personatus (L.) **Flybug** Newton St Loe, Bath ST693 637 (vc6) 6 August 2003 Darrel Watts. One on a wall next to a moth trap. This interesting species has a larva which coats itself with material from its surroundings to camouflage itself against predation. The adult is dark brown and fully winged. The insect is a nocturnal predator of other insects. In the past it was a more familiar insect in houses where it hunted bed bugs, for example.

LEPIDOPTERA (butterflies)
Boloria selene selene (D. & S.) **Small Pearl-bordered Fritillary** Dolebury Warren ST44 58 (vc6) one on 29 May and two on 20 June 2003 Jean Webb. Iron Acton ST692 828 (vc34) 16 August James Bond, the single butterfly was presumably part of a partial second brood.

Argynnis paphia (L.) var. *valezina* **Silver-washed Fritillary** Tickenham Hill ST445 724 (vc6) July/August 2003 Keith Giles. A mating pair of the butterflies included a female of the local, dark form known as *valezina*.

Euphydryas aurinia (Rott.) **Marsh Fritillary** Folly Farm ST611 603 (vc6) 7 June 2003 Mr Brookman (one seen) and ST611 603, ST 612 603 & ST613 604 Mary Wood & Craig Stenson 12 June 2003 (singles at each site).

Melitaea cinxia (L.) **Glanville Fritillary** Tickenham Hill ST442 723 (vc6) 12 June 2003 Keith Giles. An individual was sketched at close quarters after it landed on grass. A stiff breeze was blowing from the Sand Point direction (clearly visible from Tickenham Hill) suggesting that the introduced colony there has not died out as feared.

Hipparchia semele semele (L.) **Grayling** Sandford Hill ST42 59 (vc6) 18 August 2003 Jen Le Blanc, Martin Evans, Roger Edmondson. Three seen.

LEPIDOPTERA (macro-moths)
Rhodometra sacraria (L.) **Vestal** Timsbury, Bath ST659 587 (vc6) 9 – 12 August 2003 Mike Bailey. Several recorded of this regular immigrant.

Charissa obscurata (D. & S.) **Annulet** Durdham Down, Bristol ST564 747 (vc34) 18 July 2003 Ray Barnett. One specimen taken at light of this local

and possibly decreasing species. First recorded at this locality in the mid 19th century, good to confirm its continued presence.

Agrius convolvuli (L.) **Convolvulus Hawk-moth** Bristol University, Woodland Road ST58 73 (vc34) August 2003 per Gareth Jones. Fishponds Allotments ST6 7 (vc34) 14 September 2003 – full grown larva det Ray Barnett.

Acherontia atropos (L.) **Death's Head Hawk-moth** Yatton ST4 6 (vc6) Tony Moulin two larvae on potato.

Peridea anceps (Goeze) **Great Prominent** Tucking Mill, Bath ST764 615 (vc6) 9 May 2003, Bristol & District Moth Group. A very local species known from larger woodland such as at Browns Folly and Wetmoor.

Noctua pronuba (L.) **Large Yellow Underwing** Shute Shelve ST424 549 (vc6) 23 March 2003 Paul Fletcher. A very early date for this common species not usually seen until June.

Mythimna obsoleta (Hb.) **Obscure Wainscot** Portishead ST457 745 (vc6) 16 June 2003 Bill Dixon. Of localized occurrence in the region.

Eublemma parva (Hb.) **Small Marbled** Portishead ST457 745 (vc6) 6 July 2003 Bill Dixon, only the second known record in the "Avon" area for this rare immigrant. The previous occasion was 2 March 1977 when Stephen Blathwayt captured a specimen at Weston-super-Mare. There had only been three previous records to that for the whole of Somerset.

Helicoverpa armigera (Hb.) **Scarce Bordered Straw** Timsbury, Bath ST659 587 (vc6) 24 August 2003 Mike Bailey. A fairly regular immigrant.

Silene sp. **Saddle-back Moth** Brent Knoll ST3 5 (vc6) per Sam Trebilcock 29 January 2003. Ten caterpillars of this North American moth were discovered on Areca Palm plants at a garden centre. The route of importation is thought to have been via nurseries in Holland. The larvae have irritating hairs that can cause a painful reaction.

LEPIDOPTERA (micro-moths)
Adela croesella (Scop.) Urchin Wood, Congresbury ST449 641 (vc6) 6 June 2003 Bristol & District Moth Group. Littlewood, Kenn Moor ST438 683 (vc6) 8 June 2003 Ray Barnett. Stoke Bishop, Bristol ST760 553 (vc34) 16 June 2003 Martin Evans. Considered a very rare and unusual species in our area until this clutch of records this year.

Haplotinea insectella (Fabr.) Pilning ST556 849 (vc34) 14 July 2003 John Martin det Mike Bailey. A scarce species nationally. Larvae scavenge detritus and on fungi.

Monopis crocicapitella (Clemens) Pilning ST556 849 (vc34) 13 July 2003 John Martin det Mike Bailey. Another species which scavenges as a larva.

Tachystola acroxantha (Meyr.) East Wood, Portishead ST465776 (vc6) 26 September 2003 Bristol & District Moth Group. Well established alien in the Weston-super-Mare area, originally from Australia, the larva feeds on ornamental Eucalyptus trees.

Pseudatemelia josephinae (Toll) Brown's Folly ST79 66 (vc6) 11 July 2003 Mike Bailey. The first record for our area, which as an adult requires identification by reference to microscopic characters.

Blastodacna atra (Haw.) **Apple Pith Moth** Redding Pits, Winford ST533 639 (vc6) 4 July 2003 Bristol & District Moth Group. The larva feeds in the flower and leaf bud causing the shoot to whither.

Pammene fasciana (L.) Redding Pits, Winford ST533 639 (vc6) 4 July 2003 Bristol & District Moth Group. A local species, larva in the fruit of oak or sweet chestnut.

Thisanotia chrysonuchella (Scop.) Fry's Hill ST43 55 (vc6) 5 May 2003 Paul Fletcher, two seen. A localized grass moth, restricted to relatively few sites in the region.

DIPTERA (true flies)
Bombylius discolor Mik. Shute Shelve ST42 54 (vc6) 29 March 2003 Paul Fletcher; Lower Woods, Wetmoor ST74 87 (vc34) 31 March 2003 Martin Evans & Roger Edmondson; Cat Grove, S. Glos. ST661 959 (vc34) 14 April 2003 Martin Evans & Roger Edmondson; Siston Common ST668 743 (vc34) 22 April 2003 Martin Evans & Roger Edmondson. Much more local than the common Beefly, *B. major*.

Volucella inanis (L.) Stoke Bishop, Bristol ST760 553 (vc34) 15 August 2003 Martin Evans. Rather similar to the following species. Was very rare but is now increasing across southern England from the population concentration in the south east.

Volucella zonaria (Poda) Burnham-on-Sea ST311491 (vc6) 15 August 2003 Robert Cropper, one seen on a garden fence is the first record for this 10km square that we are aware of. This large hoverfly is widespread within the city of Bristol and has benefited from milder winters recently and is increasing.

Asilus crabroniformis Sandford Hill ST429 587 (vc6) 19 & 20 August 2003 Martin Evans & Roger Edmondson. A rare and localized species found at scattered locations throughout the region.

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Ivy-leaved toadflax

Bristol region Invertebrate Report, 2004

RJ Barnett
City Museum, Queens Rd BS8 1RL
E-mail: ray_barnett@bristol-city.gov.uk

INTRODUCTION

2004 was a fairly quiet year with regard to invertebrate records. Butterfly activity began in late January with movements of the usual hibernating species such as the Peacock. However this was curtailed by some colder weather in late February. The most interesting observations early on were the reports of Hummingbird Hawk-moths in March. Following the exceptional number of these immigrant insects which were seen in 2003 it would seem highly likely that these represented individuals which had managed to over-winter, a recent phenomena noted elsewhere in England in the last few years. A record of a further immigrant, the Dark Sword-grass moth, in February could suggest that the Hawk-moths did actually result from immigration but it is very unusual for these moths to arrive early in the year. Over-wintering still seems the most likely explanation.

Other moth records of significance include the arrival of a species which has been increasing across the British Isles since it first colonised our shores a few years ago. *Argyresthia trifaciata* feeds on Leyland Cypress *Cupressocyparis leylandii* and the like and has been aided in spreading across the country by the trade in garden plants. It was only a question of time before it was found here. Two other new species were *Cydia amplana* and *Crocidosema plebejana* which have only recently been recorded as regular immigrants to the British Isles. Their discovery, on subsequent nights in the same light trap, coincided with very large numbers reaching the south coast of England. Numbers of more usual immigrants were generally surprisingly small. However Ken Poole was delighted to record a Striped Hawk-moth in his garden a first in all his years of trapping there. A second new species to his garden list in 2004 was the Chocolate-tip bringing his garden list total to 360. Aside from immigrants, a Forester moth was discovered by Dave Pritchard at Bannerdown, a species easily confused with the Cistus Forester, and a species for which records had been appealed for in 2003 with no success.

The occurrence of a single Colorado Beetle on an organic farm in Abbots Leigh was undoubtedly due to importation of crops from Spain where the beetle is known to occur.

A record of the very rare soldierfly *Villa cingulata* at Tucking Mill, near Bath was reported in the Proceedings for 2000. To find this species in 2004 at Leigh Woods, during a public walk to look at the variety of insect life, was a great surprise. This brings the recent British localities where the fly has been seen to about half a dozen. Whether this apparent resurgence is due to recent mild winters, and whether it will continue, are questions that are difficult to answer. The mildness of our winters at present must be responsible for the incredibly late report of a Common Darter in December and also the continued reports of worker bumble-bees into the middle of winter.

My thanks to all who have submitted records directly to the Society, to the Bristol Regional Environmental Records Centre (BRERC) and to the Bristol Wildlife e-group. The importance of receiving, not just the records picked out here, but those of perhaps less noteworthy species cannot be understated in terms of monitoring the ever changing status of the invertebrate fauna.

Scientific nomenclature follows that given in Bradley(2000), Brooks (1997), Chandler (1998), Duff (1993), Fitton *et al* (1978) Hayward *et al* (1996) and Potts (1964).

Species of note in 2004

INSECTA

Odonata (damselflies and dragonflies)

Hairy Dragonfly *Brachytron pratense* (Mull.) Weston Big Wood ST 45 75 (vc 6) 29 May 2004 Ray Barnett. (A local species but widespread in the region, often hunts in woodland away from water.)

Common Darter *Sympetrum striolatum* (Charp.) Meare Heath, Somerset ST4 4 (vc 6) 17 December 2004 Maggie Gamble. (A very common species but an extremely late date.)

ORTHOPTERA

Long-winged Cone-head *Conocephalus discolor* (Thunberg) Gee Moor, S. Gloucestershire ST656 729 (vc 34) 23 August 2004 Jenny Dowell & Vicky Hale; Claverton Down, Bath ST77 63 (vc 34) 29 July 2004 Alan Barrett; Chilcombe Bottom ST770 685 and ST764 685 (vc 34) 21 August 2004 Alan Barrett; Charmy Down Farm ST768 689 (vc 34) 21 August 2004 Alan Barrett; Near Charmy ST765 688 (vc 34) 21 and 28 August 2004 Alan Barrett; Bathampton Down ST775 655 (vc 34) 10 and 19 August 2004 Alan Barrett; Bathwick Fileds ST760 645 (vc 34) 10 August 2004 Alan Barrett; North Road ST764 648 (vc 34) 10 August 2004 Alan Barrett; Bathampton Meadows ST782 671 (vc 34) 17, 27 30 July, 10 August, 9 and 15

September 2004 Alan Barrett. (A species which continues to expand its distribution across southern England and within the Bristol region. Many of Alan Barrett's records were achieved by using a bat detector to detect the calls of the insect.)

HEMIPTERA (true bugs)
Thyreocoris scarabeiodes (L.) Walton Common ST42 73 (vc 6) 03 May 2004 Ray Barnett. (A small species which is therefore often overlooked.)
Corizus hyocyami (L.) Weston Big Wood ST45 75 (vc 6) 24 April 2004 Ray Barnett. (The striking red and black bug is associated with the coast but seems to be increasingly recorded more inland.)
Stictopleurus abutilon (Rossi) Siston Common ST668 742 7 September 2004 Martin Evans and Jim & Janet Boyd. (This bug was taken in the south east of England in the 19th century but not seen again until the 1990s since when it has been found at several sites in southern England. It is likely that the species has colonised following the accidental introduction of specimens from the continent into this country and it is now expanding its distribution.)

LEPIDOPTERA (butterflies)
Essex Skipper *Thymelicus lineola* (Ochs.) Brandon Hill, Bristol ST579 727 (vc34) 27 June 2004 Ray Barnett; Redding Pits ST533 637 (vc 6) 3 and 31 July 2004 Melanie Patch; St Catherine's Valley ST769 713 (vc 34) 1 August 2004 Andrew Daw. (Undoubtedly regularly passed over as a Small Skipper but the species is still inceasing in the region and becoming more common.)
Small Pearl-bordered Fritillary *Boloria selene* (D. & S.) Dolebury Warren ST 451 589 (vc 6) 10 June 2004 Jean Webb; Sandford Quarry ST42 59 (vc 6) 24 May 2004, Kurt Vickery & Paul Fletcher (over 25 individuals counted by KV on a day in June). (The future of this butterfly in the region still looks bleak, where possible steps should be taken to safeguard the remaining populations.)

LEPIDOPTERA (micro-moths)
Argyresthia trifaciata Stdgr. Filton, Bristol ST60 79 13 May 2004 Andy Pym (First record for vc 34 and Bristol region, a species which was first reported from the south east in 1982 and since it has been spread across the country.)
Apodia bifractella (Dup.) Dryham Park ST7 7 (vc 34) March 2004 Mike Bailey. (Larvae collected in March and reared to adults in July. An inconspicuous and over-looked species.)

Crocidosema plebejana Zell. Pilning ST556 849 11 August 2004 John Martin (First record for vc 34 and Bristol region, an increasing immigrant to the south coast where it may be established.)
Cydia amplana (Hb.) Pilning ST556 849 10 August 2004 John Martin (First record for vc 34 and Bristol region, a sporadic immigrant which appears to be appearing more frequently in the British Isles)
Palpita vitrealis (Rossi) Timsbury, Bath ST659 587 (vc 6) 30 October 2004 Mike Bailey. (A fairly regular immigrant.)

LEPIDOPTERA (macro-moths)
Forester *Adscita statices* (L.) Bannerdown, Bath ST 79 68 (vc 34) 22 May 2004 Dave Pritchard. (A very localised species, easily confused with the Cistus Forester.)
Cistus Forester *Adscita geryon* (Hb.) Walton Common ST42 73 (vc 6) 29 May 2004 Paul Chapman. (A nationally scarce species found in the Bristol region on calcareous downland.)
Red-belted Clearwing *Synanthedon myopaeformis* (Borkh.) Victoria Park, Bedminster, Bristol ST (vc 6) 7 June 2004 Andrew Duff. (Populations breeding in street trees in Bristol may represent relicts from pre-urbanisation times which have managed to maintain themselves despite the growth of the city around them.)
Mullein Wave *Scopula marginepunctata* (Goeze) Wain's Hill, Clevedon ST39 70 (vc 6) 27 May 2004 Paul Chapman. (A species of local occurrence along the coast of the region.)
Ruddy Carpet *Catarhoe rubidata* (D. & S.) Carlingcot, Bath ST695 582 (vc6) 28 June 2004 Martin Hunt. (A national scarce species of very occasional occurrence in the Bristol region.)
Grass Rivulet *Perizoma albulata albulata* (D. & S.) Bannerdown, Bath ST 79 68 (vc 34) 15 May 2004 Ray Barnett. (A local species confined to meadows where Hay Rattle grows.)
Pinion-spotted Pug *Eupithecia insigniata* (Hb.) Near Portishead ST457 745 (vc 6) 08 May 2004 Bill Dixon. (A rare and unusual species even though the larvae feed on Hawthorn.)
Death's Head Hawk-moth *Acherontia atropos* (L.) Bedminster, Bristol ST5 7 (vc 6) July 2004, identified at Bristol Zoo, unrecorded source; larva at Weston Airfield ST34 59 (vc 6) Raymond Cook. (A scarce immigrant but one or two appear in the region most years.)
Hummingbird Hawk-moth *Macroglossum stellatarum* (L.) High Kingsdown, Bristol ST58 73 (vc 34) 17 March 2004 feeding at daffodil Brian Tizard; St Andrews, Bristol ST 59 74 (vc 34) 24 March 2004 feeding at *Aubretia*; Clifton, Bristol ST 5 7 (vc 34) 29 March 2004 feeding at *Viburnum tinus* Richard Bland; Blagdon ST5 5 (vc 6) 11 June 2004

Warwick White; Pilning ST556 849 (vc 34) 07 & 18 July 2004 John Martin; Timsbury, Bath ST6 5 (vc 6) 28 August 2004 Cyril Matthews. (The very early dates of appearance, the very high numbers of immigrants moths recorded in 2003 and the lack of a similar immigration in 2004 all point to the records early in the year representing over-wintered individuals.)

Striped Hawk-moth *Hyles livornica* (Esp.) Weston-super-Mare ST33 61 (vc 6) 11 June 2004 Ken Poole. (A rare immigrant only very occasionally reported from the region.)

Elephant Hawk-moth *Deilephila elpenor* (L.) Whitchurch ST6 6 (vc 6) August 2004 Rich Andrews. (Larva found feeding on water lily in garden pond!)

Buff Footman *Eilema depressa* (Esp.) Newton Park, Newton St Loe, Bath ST693 639 (vc 6) 28 July 2004 Darrell Watts. (A species of local occurrence but perhaps overlooked amongst Dingy Footman.)

Dark Sword-grass *Agrotis ipsilon* (Hufn.) Bishopston, Bristol ST58 75 (vc 34) 5 February 2004 Rupert Higgins. (A common immigrant but included because of the very early date.)

Old Lady *Mormo maura* (L.) City Museum & Art Gallery, Clifton, Bristol ST581 732 (vc 34) 01/07/04 and another individual 14/07/04 Ray Barnett; Bishopston ST58 75 (vc 34) 31 August Rupert Higgins (6 in one night). (Of local occurrence and unusual for so many to be seen together on one night in the city.)

Small Yellow Underwing *Panemeria tenebrata* (Scop.) Bannerdown, Bath ST 79 68 (vc 34) 15 May 2004 Ray Barnett. (Probably over-looked but still a localised species.)

Scarce Bordered Straw *Helicoverpa armigera* (Hb.) Timsbury, Bath ST659 587 10 August 2004 Mike Bailey. (A fairly regular immigrant.)

COLEOPTERA (beetles)

Amara curta Dej. River Avon, Bristol ST574 722 (vc 6) 1 July 2004 Andrew Duff. (A Nationally Notable species of very localised occurrence, Duff, 1993, for example, only gives three records for Somerset.

Sinodendron cylindricum (L.) Leigh Woods, Bristol ST55 73 (vc 6) 07 June 2004 Ray Barnett. (Widespread but local in woodland.)

Notoxus monocerus (L.) Sand Bay, Weston-super-Mare ST328 634 (vc 6) 08 May 2004 Ray Barnett. (A speciality of sandy coastal habitats, recorded previously at Sand Bay in 1978 by Robert Cropper, for example, (Duff, 1993).)

Agrilus pannonicus (Pill. & Mitt.) Siston Common ST668 742 (vc34) 05 July 2004 Martin Evans and Jim & Janet Boyd. (First record for the Bristol region and probably for vc 34, an adult beetle now in the collection of Janet Boyd. This family of beetles (Buprestidae) is represented in the British

Isles by a small number of rather inconspicuous species but an important part of the deadwood fauna.)
Colorado Beetle *Leptinotarsa decemlineata* (Say) Near Bristol ST53 74 20 May 2004 per City Museum & Art Gallery. (An infamous but unusual accidental import, thought to have arrived on produce from Spain.)
Platyrhinus resinosus (Scop.) Leigh Woods, Bristol ST55 73 (vc 6) 07 June 2004 Ray Barnett. (Widespread but local in woodland.)

HYMENOPTERA (bees, wasps and ants)
Hornet *Vespa crabro* L. Bishop Sutton ST585 598 (vc 6) one on 10 August caught in wasp trap and one in house 6 September, never seen before in this garden between 1963 and 2003 inclusive, David Warden; Walton Down ST4 7 (vc 6) 2004 Keith Giles; Horton Great Trench, Lower Woods ST745 876 (vc 34) 16 May 2004 Martin Evans & Carolyn Lamb and on 08 June 2004, Martin Evans & Roger Edmondson; Lower Woods, ST751 883 (vc 34) 2004, Hazel Willmott (nest discovered).
Bombus terrestris (L.) Corsham, Wilts ST876 695 28 December 2004 Darrel Watts. (A very late date, bumble bee workers continued to be seen in the region into the New Year.)

DIPTERA (true flies)
Villa cingulata (Meig.) Leigh Woods, Bristol ST555 731 (vc 6) 11 July 2004 (2 individuals, one taken) Ray Barnett. (After an absence of about 80 years, this species was re-discovered as a British insect in 2000 and since has been found at a small handful of sites including, now, Leigh Woods.)
Meliscaeva auricollis (Meig.) (var. *maculicornis* (Zett.)) St Andrews, Bristol ST59 74 (vc 34) 14 February 2004 Simon Randolph. (A very early date, Levy & Levy 1998, for example quote the earliest ever known record in Somerset as 21 February.)
Parhelophilus consimilis (Malm) Shapwick Heath, Somerset ST421 409 22 May 2004 Martin Evans & Roger Edmondson. (A Red Data Book 2 species known to be present on the Somerset Levels where it may be easily over-looked.)
Volucella inflata (Fabr.) Weston Big Wood ST 45 75 (vc 6) 29 May 2004 Ray Barnett. (Widespread but local in woodland.)

HYDROZA
Chondrophora
By-the-wind Sailor *Velella velella* (L.) Severn Estuary (vc 6 and 34) late September 2004, many observers.

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Yarrow

Fish on the River Chew

RL Bland from data supplied by the Environment Agency

The River Chew emerges from a spring in long dry valley at Chewton Mendip at about 130m ASL, flows through Litton, is joined by three streams emerging from springs above East Harptree, and is then rather abruptly halted by Chew Lake, at a height of about 110m. This was flooded up just fifty years ago, and is now a mecca for sailors, birds, and fishermen. It is a wonderful wildlife habitat, well managed, and well stocked with fish. Below the lake the river re-appears at a height of 90m, and flows for 12 km to join the River Avon at Keynsham at a height which is just two metres above the level of the highest spring tides. It is thus a vigorous stream, falling a metre for every 130 metres of length. It also draws on a whole series of minor streams draining Winford and Dundry to the north as well as the Marksbury and Chelwood areas to the south. A minimum flow is guaranteed, but in times of flood it can rise very abruptly and its bridges all have high arches. For much of the way it lies between steep and occasionally precipitous sides.

Its fish are monitored by the Environment Agency who carry out surveys at four sites along its length, just beyond the Chew Dam, at Pensford, Compton Dando, and Keynsham Park. Their results in terms of fish biomass can be compared with those of around 1000 other sites in Britain. The Chew ranges from exceptional below the Chew Dam to average at Compton Dando and below average at Keynsham. Table 1 lists the sites and species numbers. The numbers are distorted by the Chew Dam results; the Compton Dando results are average.

	Chew Dam	Pensford	Compton	Keynsham	Total
Roach	692	5		32	729
Eel	67	19	3	16	105
Gudgeon	54	3	2	13	72
Brown Trout	2	29	33		64
Dace		39	23		62
Perch	16	1		3	20
Grayling		14	4		18
Chub			3	5	8
Rudd	1				1
Pike	1				1
Total	833	110	68	69	1080

Table 1 River Chew 2004. Fish caught at the four survey sites

They found 13 species present. Bullheads, Minnows and Stoneloach were present at every site, and their numbers and biomass were discounted. 68% of the fish caught were Roach, but this was because they were present in huge numbers, 692, at the first survey point, just below Chew Dam, where there is the sewage works outfall, which produces perfect conditions for Roach. The biomass present at this site is higher than that of any other site in the country, as the river, though not broad, is deep. In 2004 it also held double the number of that in 2003.

The next commonest fish were Eel, and Gudgeon were found at every site, commonest at the Chew Dam. 64 Brown Trout were found, mostly at Pensford and Compton Dando and there were none at Keynsham. 62 Dace were caught, and they had an almost identical distribution. There were 20 Perch, mostly at the Chew Dam, 18 Grayling, mostly at Pensford, eight Chub in the lower reaches, and one Rudd and one Pike at the Chew Dam.

Chart 1 below shows the pattern of fish biomass along the length of the river. The left hand scale is kilogrammes per hundred square metres

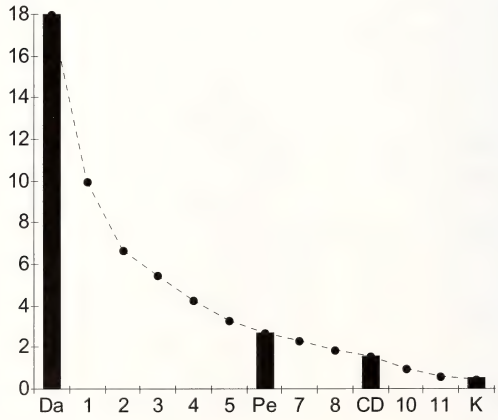

Chart 1.River Chew. Fish biomass at the four survey sites, bars, in Kg/100m^2 and , dotted line, interpolated values.

Sharp Eyes

"So fair and foul a day I have not seen" Macbeth

The weather has seldom been far from the lips of an Englishman, or a Scotsman, but it has been fascinating to watch the way in which "Climate Change" and "Global Warming" have moved up the political agenda. That there are two phrases, not one, suggests a degree of fudge about the issue. The study of climate is ancient, and arcane. We need to understand why, in recent geological time, the climate has swung between the extremes of ice-age and inter-glacial. That there are complex feed-back processes at work is obvious, but what tips the world between the two systems is quite unclear. Within historic times minor climatic swings have led to the rise and fall of civilisations. The past two hundred years have seen an unparalleled human population growth. The boxing-day tsunami demonstrated vividly the degree to which this has created a situation where normal, if rare, natural events can have dramatic human consequences.

The arrival of satellite technology, and computers, has enabled the measurement of some of the factors controlling climate change, such as ocean temperature and the ozone layer. But of all the environmental problems the world faces global warming is the one whose causes are least understood, whose effects are most likely to be felt in the distant future, and which is the least accessible to human action and control. A cynic might suggest that governments are concentrating on it to avoid seeking solutions to the destruction of forests, the shortage of water, desertification, the chemical pollution of the seas, the nitrate pollution of our rivers, the impact of acid rain, the use, in just a couple of generations, of the whole world's supply of hydrocarbons, and, above all else, the continuing expansion of world population.

Since 1853, when GF Burder began his thirty year study of the rainfall of Clifton, members of the BNS have been recording the local weather in detail. Their records show that there has been a warming process. The figure for a rolling twenty year average annual temperature since 1881 shows that temperature rose on average by 1.0C between 1900 and 1925, stayed at the new level until 1960 and fell by 0.5C to 1980. Since then it has risen back to the long term average since 1881, but we are still 0.3C degree colder each year than we were fifty years ago. This does not mean that the science of global warming is wrong. At the end of an interglacial one might expect the world to be warming. It does mean that we would be foolish to assume that carbon-trading will solve all our problems. The world will have to change much more fundamentally than that. But let us take a crumb of comfort. Environmental problems have reached the top table. They won't be going away.

Obituary. Rae Vernon 1929-2005

Professionally Rae Vernon worked as entomology adviser for the Ministry of Agriculture, but he was always a bird-watcher at heart and became actively involved in the fieldwork of the Ornithological Section of the Society in the 1960s. In particular he participated in the early extension of the winter duck counts, organized by the Wildfowl Trust from the early 1950s, to the waders and gulls of estuaries. This has since become a single survey, known as the Wetland Bird Survey which every winter counts all ducks and waders throughout the British Isles. He also became involved in counting Rooks nests. This was a species that was very well studied because many farmers regarded it as an agricultural pest, though there were others who suggested that the damage it did by eating grain was counterbalanced by its impact on wireworm. The area between the A38 and the Severn Estuary had been counted annually from 1933 to the war by Brunsden Yapp, who was a great pioneer of the systematic study of bird populations, and a series of counts of the same area in the 1960s revealed a substantial population fall from a peak in 1956.

This local work was to lead to the second national Rook survey organized by the BTO in 1975. Bryan Sage and Rae were responsible for organizing this and the results were published in Bird Study in 1978. It was a much more effective study than the previous one in 1945. Five years later the BTO organized a sample survey to check on population change, and the opportunity was taken to re-survey the whole of Avon county. The national results were published in bird Study 1985, the local ones in the Fieldwork Review 1983. Rae was responsible for counting two 10km squares in that survey. Subsequently counts have been organised every five years, and a summary of the whole history of Rooks in the county written by Rae has been published posthumously in the Avon Bird report for 2004.

In the 1980s Rae retired and moved across the river to Chepstow, and began working on what was to be his magnum opus, an Atlas of the Birds of Morocco. This was published in 2004, and voted one of the best bird books of the year by British Birds in March 2005 who called it “a milestone in African ornithology”.

Rae followed in the footsteps of a long line of notable local ornithologists who have done so much to turn ornithology from a simple hobby to an exact science.
R.L.Bland

Society Business

President and Council for 2004

The following officers and members of Council were elected at the AGM on January 24th2004. They are the Trustees of the Society.

Officers
President; Mr. S Carpenter.
Hon. Treasurer; Mr. RG Symes. Hon. Secretary; Ms. A M Leivers.
Hon. Librarian; Mrs. AF Hollowell Hon. Editor; Mr. P Belcher.
Hon. Membership Secretary; Mrs AM Wookey.
Hon. Distribution Secretary; Mr B Frost. Hon. Archivist; Mr SM Taylor.
Hon. Bulletin Secretary; Mr. DB Davies. Webmaster; Mr. D Strawford.

Section Officers.
Geology; Mr. DW Cope. Botany; Mrs. P Millman
Invertebrates; Mr. R Barnett, Mr AG Smith. Mammals; Mr DPC Trump
Ornithology; Mr. RL Bland, Dr. M Hill.
General Section; Miss S McCarthy.

Ordinary Members.

Miss SM Garden. Mr. T Corner. Mr.SJM Reece. Mr.R Muston.
Ms.A Pedlow. Mr. N JWray. Mr. HG Morris. Dr. WE Dixon.
Mr. E Drewitt.

Report of council for 2004

Simon Carpenter

This is an edited version of the report submitted to the Charity Commission. Sections omitted repeat information available elsewhere in this publication.

In the course of 2004 the Society held 38 Field meetings and 27 indoor meetings. Significant contributions were made by the Society to the Festival of Nature held in the City in October. (see below). The Society's President organised an extraordinary meeting at Bristol Museum in July to provide ordinary members with an opportunity to discuss the 'way ahead for the society.' Many aspects of the Society's work were discussed and an action

plan produced by the President to highlight areas of the Society's business that could be improved and made more effective. David Hill, our professional facilitator from Bristol University, was thanked for his support and input on the day. Society representatives also met with the Managers of Bristol Regional Environmental Records Centre (BRERC) to discuss a closer working partnership between the two organisations. In particular, the sharing of data was discussed and plans outlined to enable this to happen.

Two members of the society were publicly honoured during the year. David Warden was given the Tucker Medal at the British Trust for Ornithology conference in December for fifty years of Nest Recording, and Hugh H Boyd was awarded the Order of Canada for his work with Canadian wildlife.

Research and Conservation

Records of observations made by members as part of both local and national recording schemes were submitted to Bristol Regional Environmental Records Centre (BRERC). Members of the Society assisted with data entry at BRERC. The Society maintained close local links with The City Museum & Art Gallery, with Bristol University (especially the Earth Sciences Dept.), with both the Avon and Somerset Wildlife Trusts, VOSCUR (The Voice of Bristol's Community and Voluntary Sector), Avon Gorge & Downs Wildlife Project and with Bristol City Council. A grant of £1000 was made from the Memorial Fund (£500 from each of the bequests made to the Society by Mrs J Morgan and Mr W J Redmond) to the Avon Wildlife Trust as a contribution towards the purchase of Prior's Wood. Regionally the Society linked with the South West Naturalists' Union, and nationally it was involved with the British Trust for Ornithology, Botanical Society of the British Isles, the Woodland Trust and Royal Entomological Society. The Society continued to be represented at meetings of the Leigh Woods Advisory Committee. The Committee received presentations concerning the proposed management of the Woods by the National Trust and their programmes of public access and education.

Promotion and Publicity

Posters announcing forthcoming meetings were produced on a regular basis and those and membership leaflets were displayed particularly in libraries. In order to promote the Society's activities and to attract new members, stands were taken at Bristol Water's Chew Valley Open Day, Bristol's Festival of Nature, the Gorge-ous Wildlife Family Fun Day, the Rock & Fossil event, Abbot's Leigh Parish Day, and at a British Association meeting. The biggest wildlife promotion event in Bristol took place during the entire month of October – called the Bristol Festival of

Nature. This month-long event was supported by the Bristol Natural History Consortium, which is a collaboration between At-Bristol, BBC, Bristol Zoo Gardens, University of Bristol, University of West of England, The Wildscreen Trust and WWF-UK. Wildlife and conservation organisations in the Bristol area were invited to run activities and events throughout the October period. The Society was responsible for twelve successful events, attracting large numbers of people and distributed over 4000 copies of a leaflet about the wildlife of Bristol produced in cooperation with the Avon Wildlife Trust and Bristol Parks Department. The leaflet initiative was welcomed and supported financially by the Society of Merchant Venturers and Bristol City Council. Avon Wildlife Trust provided illustrations. The Geology section created a separate leaflet promoting the rocks and landscape of the Bristol district. The cost of that leaflet was supported by the Society with a contribution from Bath Geological Society. Publications produced by the Society were offered for sale at events. The revenue from these was small, and the main benefit of attending was to promote the aims of the Society. In the course of the year a new logo for use on publicity material was produced for the society.

Thanks

The Society is indebted to the large number of its members who gave their time freely to support the activities of the Society and in some cases generously donated funds to the BNS. This help was much appreciated by the Society and was vital in helping it to meet its many objectives. Special mention must be made of members of the Society who continue to save the Society substantial postal charges by delivering Society publications by hand. The Society acknowledges with gratitude the facilities and support given by the Earth Sciences Department, University of Bristol, Dr M S Spurr, Headmaster of Clifton College and Mr Simon Garrett, Head of Education at Bristol Zoo Gardens for the use of their premises for meetings and Mr Paul Barnett, Head of Cultural Services, Bristol City Council for continued support of the Society Library located within the City Museum & Art Gallery.

Library report for 2004
Roger Symes

Reports of new accessions, featured regularly in the Bulletin, again interested members. Details of all journals held, and of about 900 books, were included on the computer database. Accession labels were added to those books which had been recorded. Development work included producing a range of reports, and starting to make the database more user-friendly. The Committee completed the year's work well within the budget agreed by Council,

An "Open Day", held in October jointly with the Bristol Museum Natural History Section, attracted a small number of new and existing members and visitors. During the year 37 members (46 in 2003) made 332 (279) visits to the Library and borrowed 256 (298) items. 6 (6) of these visits were made by new members and 3 visits were by members of the Museum staff. 18 journals were received by subscription, 25 by exchange. 9 books were purchased. 94 books (some 70 of which were given by Miss Margaret Rogers), 64 issues of journals, and 5 pamphlets/ off-prints and reports, which had been donated, were accepted into the library stock. A further 70 books and journals offered by Mr Fred Peddle were being assessed and processed. Special name plates were added to items donated. For these donations we were indebted to Dr R Bradshaw, Dr MH Martin, Mr PJM Nethercott, Mr FH Peddle, Miss MH Rogers, Dr WI Stanton, Mr RG Symes, Mr BA Tizard, Mr DPC Trump, Mr DA Wilson, and also to Avon Biodiversity Partnership, Bath Natural History Society, The Biodiversity Directorate, Bristol Regional Environmental Records Centre, and the University of Leeds, Botany Dept.

The Society's Council considered the need for insurance cover for books and furniture. A risk assessment had been produced, and advice was sought from an Insurance Broker, and from the Charity Commission. The Trustees concluded that threats to library stocks and equipment were mainly from water damage (from flood or from fire hoses), fire, physical damage from unsuitable handling, or loss (accidental or theft) and that none of these was considered as very likely. The Library had been in its present location since 1922 and the only significant factors known were losses due to theft many years ago, before new entry procedures had been introduced. The impact of losses of individual items would not have a serious effect on the working of the Society, and the Society had reserve funds which could, if necessary, be used to re-stock, as Council might decide was appropriate. The costs of the premium were considered to outweigh the benefits that such a policy might

provide, and it was decided that it would be more cost efficient to bear any loss that might occur. Council asked the Library Committee to consider whether any measures were needed to protect books on high and low shelves from possible water damage.

In accordance with the charitable status of the Society, but subject to appropriate security considerations, access to the Library was made available to others, particularly by arrangement with the University of Bristol. Three visits were made by members on the staff of the City Museum. The Society thanks the Head of Museum Services, Bristol City Council, for continued use of the Library room, and for the assistance given to members during the year by Museum staff, and welcomes the continued use made by the Library by Museum staff.

Mrs. A.F. Hollowell was re-elected as Honorary Librarian. The Library Committee met on three occasions. Members were Mr. R.G. Symes (Chair), Mr. R.L. Bland, Mr. P.J.M. Nethercott, Mr. B. Tizard, Mr. D.P.C. Trump, Mr. D.A. Wilson, Mrs. A.M. Wookey, and Mr. M.A.B. Wordsworth. The Society's Archivist was invited to attend meetings. Members continued to staff the Library from 12.30pm to 1.30pm on Wednesdays, and from 10.15am to 12.00pm on Saturdays. All members of the Committee are thanked for their assistance during 2004. Sadly Mr PJM Nethercott felt unable to stand for re-election for 2005. Philip had been instrumental in establishing the Library Committee, and had been a stalwart in contributing to, and helping to maintain the standard of the Library for many years. The importance of his involvement in the development of the BNS Library to its present excellent condition cannot be over-emphasised and most sincere thanks are due to him.

Publications Committee Report for 2004

Richard Bland

Volume 63 of Nature in Avon had been sent to the printers in September, but not printed by them until December. They were then distributed in January 2005. The Committee felt that, having been so seriously let down, they must find a new, reliable printer. He said that the Committee deeply regretted the disappointment of members, and intends to produce the next volume by October 2005. The Editor, Mr Peter Belcher has announced his desire to resign after two years, and two excellent productions. Mr Bland has offered to take on the job.

The Avon Ornithological Group also had to announce that the Avon Bird Report would not be available until January 2005 as a result of a fundamental change in the computer language in which it is written. This should result in an improvement in the report's appearance and assist in the early production of the 2004 report.

The monthly bulletin was continuing to provide members with information and interest, and it has tended to increase in size. Mr Bland congratulated Mr D Davies for his hard work in producing the Bulletin.

The website is providing a regularly updated news page, and some reports, as well as the current Bulletin, a diary, and outlines of the Society's activities. It is hoped that an even wider proportion of the membership will use it. The Committee expressed gratitude to Mr D Strawford, webmaster. At the December meeting of Council it was agreed to create a committee to investigate the desirability and costs of creating a website independent of the City Council, who have been our hosts since 1997.

Botany Section Report 2004

Pam Millman

At the AGM on 20 Jan the Officers and Committee were re-elected: President: Mr A.G.Smith, (prop J.Millman,sec M.Webster), Hon.Secretary/Treasurer: Mrs P. Millman (prop M.Webster, sec C.Kitchen.) Committee Members: Ms L. Houston, Mrs C.Kitchen, Mr M.Kitchen, MrC.Hurfurt, Mrs M.Webster. Mrs S.Parker, Mr T.Titchen. Ms Mary Wood was elected on to the committee.

Section Meetings

Five meetings were held with talks and seven field meetings in the White Sheet. In addition there were several evening field meetings led by members of the committee.

26 Jan	AGM and members evening	
24 Feb	British Ferns	Pat Hill-Cottingham
22 March	Moving a Botanic garden	Nick Wray
17 April	Priors Wood, Portbury	Pam Millman
20 May	Keynsham Humpy Dumps	Chris Hurfurt
22 May	Castle Combe area	Chris Hurfurt
5 June	The Downs	Libby Houston
10 July	Max Bog	Tony Smith
4 Aug	Tytherington	Mark and Clare Kitchen
7 Aug	Lawrence Weston Moor	Mary Wood
5 Sept	Tidenham Chase, Forest of Dean	Tony Titchen

25 Oct	Native Orchids of Britain	Tony Hughes
22 Nov	Tyntesfield Trees	Tony Titchen
29 Dec	Plants of the Picos de Europa	Mark and Clare Kitchen

In addition this year we continued the two year survey noting **change** in our local flora as part of the BSBI project for the three tetrads in ST66 based around Stockwood Vale, Stanton Wick and Stanton Prior. We held six recording meetings led by five different members and about 2000 records were made over the two years. Details were given in each month's Bulletin. I will report on feedback from the BSBI on this project.

For the Bristol Festival of Nature in October Justin Smith introduced a very large group of the general public to the exciting world of fungi; Tony Smith and Pam Millman also led a walk looking at the ferns and mosses of the Frome Valley. Hopefully these events will have encouraged people to join the BNS.

We continue to send records to BRERC. Members are involved with the Somerset Rare Plants Group.

We are very pleased to welcome Dr Clive Lovatt, who has taken over from Professor Willis as Editor for Bristol Botany. His work on the ecology of the Avon Gorge is well known. As a token of the thanks of the Bristol Naturalists' Society in general and the Botanical Section in particular, the Society has procured a specially made and signed Bristol Blue vase standing 16cm high and which has been deep-engraved with silver in honour of Professor Emeritus A.J. Willis of Sheffield University. It will be presented to him early in 2005.

Report of the Invertebrate Section, 2004

Ray Barnett

Ray Barnett and Tony Smith were re-elected Honorary President and Honorary Secretary, respectively at the AGM held at the City Museum & Art Gallery, Bristol. Following the precedent established in 2003, the President suggested that the membership be particularly asked to report if they found particular species during the year and the following had been selected for 2004: Garden Snail *Helix aspersa*, Clothes Moths *Tinea biselliella* or *Tinea pellionella* and the Woodice Spiders *Dysdera crocata* and *D. erythrina*. The previous year's appeal had produced some sightings of the Rose Chafer beetle *Cetonia aurata*.

The following indoor meetings were held:

18th January	Section AGM
14th February	Tony Smith *Hemiptera Identification Workshop*
18th March	Mike Bailey *Moths – identifying the key factors affecting survival*
24th November	Paula Donnelly *Conservation of Mole Crickets at Bristol Zoo Gardens*

and the following field meetings:

17th April	Ray Barnett, British Plant Gall Society & Somerset Invertebrate Group *Walton Common*
8th May	Tony Smith *Sand Bay*
29th May	Bill Dixon *Weston Big Wood*
13th June	Ray Barnett, Tony Smith & Bristol & District Moth Group *Wetmoor*
18th July	Tony Smith & Bristol & District Moth Group *Wetmoor*

Ornithology Section Report, 2004

Mary Hill

At the 2004 AGM, held on January 16th 2004, Richard Bland agreed to continue as Acting President and Mary Hill as Secretary and Treasurer. Paul Farmer, who had previously been co-opted onto the committee, was elected to it and he joined Joyce Callard, Richard and Ann Crawford, Ed Drewitt, Alison Levinson and Mike Taylor who were all re-elected for a further year. Brian Tizard had finished his term of service and was thanked for his contribution.

In 2004 there were 6 lecture meetings and 18 field meetings. They are listed below. The meetings were well attended (see numbers listed). We are very grateful to all our speakers and field meeting leaders.

Lecture meetings, 2004

January 16th	AGM + Don Cullen	Impressions of Borneo
February 11th	Emma Smith	Beasts in Battle
March 10th	David Boag	The Changing River
October 20th	Peter Exeley	A Future for Farmland Birds
November 10th	Dick Best	Wild bird casualties – The ethics, significance & practicalities of intervention in 'natural' processes'.
December 8	Paul Chadwick	Birds at both ends of the Andes

Average attendance 40.2
(c.f. 38.5 in 2003 and 47.3 in 2002)

Walks, first winter period 2004

January 21st	W	Slimbridge	Trevor Evans + Warden
February 7th	Sat	Barnes WWT	with General Section
March 27th	Sat	Brean	Paul Farmer

Average attendance 15.7

Summer walks 2004:

April 15th	Thu	Leigh Woods	Richard Bland
April 24th	Sat	Forest of Dean	Tim Fretter
May 8th	Sat	Chew	Ed Drewitt
May 13th	Thu	Frome Valley	Richard Bland

May 19th Wed	Newton St Loo	Paul Farmer	
June 3rd Thu	Walton Common	Richard Bland	
June 16th Wed	Goblin Coombe	Paul Farmer	
July 6th	Tue	Marshfield	Pauls Chadwick & Farmer
August 28th	Sat	Ringing Demo	Lyndon Roberts

Average attendance 13.3

Walks, second winter period 2004

More walks than usual were held in October in connection with the Bristol Wildlife Festival

October 9th	Frome Valley	Richard Bland
October 10th	Ashton Court	Richard Bland
October 17th	Blaise	John Tully
rained off		
October 23rd	Chew	Paul Farmer
November 21st	Cotswold water park	Sue and John Prince
December 29th	Chew	Paul Farmer

Average attendance 14.8

Average attendance over all walks 14.2 (c.f. 9.63 in 2003)

Fieldwork 2004.

Members of the society were involved in a wide variety of national and local surveys in 2003. These included: The national Breeding Bird Survey, which monitors all common species annually and covered 190 local squares this year; the Waterways survey; the Heronry survey; the WeBS counts of waterfowl and waders; the BTO National Gull Roost survey; the BTO national Nightjar Survey; the BTO national Swallow Feeding survey, the national House Sparrow survey; the Nest Record Card Scheme; and the national ringing scheme.

They also participated in BTO Garden Birdwatch, Bristol Birdwatch, and the society's own 30 year old Winter Garden Survey. They continued to monitor wintering Blackcap and Chiffchaff populations, and winter populations through the Winter Bird Counts.

Involvement with Local Authority.

The results of BBS work are sent to the four Unitary Authorities' Environmental departments, and in Bristol these results are used as part of the annual Quality of Life Audit. Bristol Birdwatch is part of the work of the Local Agenda 21 Biodiversity Committee, which has revealed the substantial role played by gardens in sustaining the City's biodiversity.

Geological Section Report 2004
Simon Carpenter

In collaboration with Bath Geological Society and the West of England Geologists' Association another successful 'Rock & Fossil' event was held on the Bristol & Bath Railway Path, on August 29th. The aim was to promote local geology and geomorphology to the public. Local newspapers picked up on the press release and ran the story on their pages. Over 400 members of the public stopped to find out more on the day. The Geology section worked closely with the Avon RIGS Group (Regionally Important Geological and Geomorphological Sites), to protect, conserve and promote the region's geological heritage. A geological site clearance project was undertaken in October to expose Jurassic rocks on the Railway Path at Saltford – to improve an existing site and to involve members in practical geological conservation work.

Mammal Group
David Trump

In March a very successful mammal training day was held at Clapton Moor Nature Reserve as part of the North Somerset Levels and Moors Project run by the Avon Wildlife Trust. It is hoped to repeat the course in 2005. The secretary was persuaded to dress up as a badger for the Gorge-ous Wildlife Family Fun Day in Leigh Woods in June. Links continue to be maintained with BRERC, the Avon Wildlife Trust and the Avon Bat Group. Since the re-formation of the Mammal Group in 1989, it is estimated that about 4,000 mammal records have been submitted to BRERC. This year c1,000 'old' records (for the years 2000-2003) were submitted electronically to BRERC – a first for the group. From 2004 onwards it is hoped that all records will be submitted this way.

Bristol Naturalists' Society Annual Accounts 2004

RG Symes, Hon. Treasurer

The accounts were approved by the Council, (the Trustees), on 8th June 2005. The Society's accounts for the past few years, which have not been published in the Proceedings because of a variety of technical problems, are available from the Treasurer.

Bankers. Lloyds TSB 58 Queens Rd BS8 1RQ
Auditors. Harwood Lane &Co Units 1-4 Crossley Farm Business Centre, Swan Lane, Winterbourne. BS36 1RH

Report of the Auditor
We have audited the financial statements which have been prepared under the historical cost convention and the accounting policies described. This report is made solely to the charity's Trustees, as a body, in accordance with the Charities Act 1993. Our audit work has been undertaken so that we might state to the Charity's Trustees those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law we do not accept or assume responsibility to anyone other than the charity and the charity's Trustees as a body, for our audit work, for this report, or for the opinions we have formed. We conducted our audit in accordance with Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements. It also includes an assessment of significant estimates and judgements made by the trustees in the preparation of the financial statements, and of whether the accounting policies are appropriate to the charity's circumstances, consistently applied and adequately disclosed. We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material mis-statement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements. In our opinion, the financial statements give a true and fair view of the state of the charity's affairs as at 31 December 2004 and of its incoming resources and application of resources, including its income and expenditure, in the year then ended and have been properly prepared in accordance with the provisions of the Charities Act 1993.

	Notes	Restricted Funds	General Funds	2004 Total	2003 Total
Incoming Resources					
Voluntary sources	2	1150	9770	10920	9414
Trading activities	3	0	992	992	870
Investment Income	4	1179	0	1179	1035
Sections Income		0	1655	1655	3937
Miscellaneous	5	0	44	44	14
Total Income		2329	12461	14790	15270
Resources expended					
Cost of generating funds					
Direct Charitable expenditure	6	4246	9661	13907	11429
Fundraising costs		0	702	702	390

Charitable expenditure					
Management and Administration	7	0	1291	1291	1554
Total resources expended	8	4246	11654	15900	13373
Net incoming/outgoing Resources for year	14	-1917	807	-1100	1897

	Notes	Restricted Funds	General Funds	2004 Total	2003 Total
Transfer between funds					
Balance brought forward					
As previously reported	14	32,371	9,282	41,653	39,531
Prior period adsjustment	15	-225	0	-225	0
As restated		32,146	9,282	41,428	39,531
Balances carried forward	14	**£30,229**	**£10,089**	**£40,318**	**£41,428**
Balance sheet as at 31/12/2004					
Current assets					
Debtors	9	2,499		2,405	
Investment Accounts	10	11,427		11,271	
Cash at bank and in hand		27,161		30,068	
		41,087		43,744	
Creditors; amounts falling due Within one year	11	769		2,316	
Net current assets			40,318		41,428
Total assets less total liabilities			**£40,318**		**£41,428**
Capital					
Designated Funds	**12/14**		24,852		26,959
Restricted Funds	**12/14**		5,377		5,187
General Funds	**14**		10,089		9,282
			£40,318		**£41,428**

Notes

2

Voluntary sources	**2004**	**2003**
Subscriptions (including income tax refund)	9,297	8,692
Bequests	500	0
Donations		
- General Fund	473	505
- Memorial Fund	250	0
- Conservation Fund	400	217
	£10,920	**£9,414**

3		
Trading Activities		
Publications Sales	987	870
Library Sales	5	0
Plant Sales	0	0
	£992	**£870**
4		
Investment Income		
Interest on deposit accounts and on		
Income tax refund	**£1,179**	**£1,035**
5		
Miscellaneous receipts	44	14
	£44	**£14**
6		
Direct Charitable expenditure	2004	2003
Meetings	538	458
Library	553	515
Proceedings and Avon Bird Report	3,417	3,741
Bulletin Printing	902	907
White Sheet Production	66	69
Publications Distribution	814	1,341
Donations and Grants to other Organisations	52	0
Special Funds Expenditure	4,246	1,699
Sections Expenditure	2,323	2,546
Subscriptions to other Organisations	45	60
Publicity	951	93
	£13,907	**£11,429**
7		
Managements and Administration	160	401
General Printing and Stationery	145	201
General Postage and Telephone	161	0
Software	61	78
Subscription Refund	0	0
Bank Charges	219	227
Public Liability Insurance	517	494
Audit Fee	0	90
Miscellaneous Expenditure	28	63
Sections Expenditure	**£1,291**	**£1,554**

8		
Surplus resources expended		
Audit fees (VAT included)	517	494
9		
Debtors		
Trade Debtors	1,114	528
Prepayments	383	413
Subscriptions (Income tax refunds)	1,002	391
Other Debtors	0	1,073
	£2,499	**£2,405**
10		
Investments		
National Savings Income Bonds	10,000	10,000
National Savings Investment Account	1,427	1,271
	£11,427	**£11,271**
11		
Creditors; Amounts falling due within one year		
Trade Creditors	0	87
Subscriptions in Advance	252	1,306
Accruals	517	494
Other Creditors	0	429
	£769	**£2,316**

Note 12
Funds of the charity
The **General Fund** is the charity's operational fund used for its day to day activities
The **Memorial Fund** combines the former Williams fund money with a legacy from Mrs Milton and with small amounts in the Harry Savory Illustrations fund, and substantial bequests from others. The Memorial fund receives legacies and donations from friends in memory of pastr members. Grants are paid at the discretion of the Council, there being no specific amim for this fund.
The **Conservation Fund** is the name accepted as that of the former conservation appeal. It receives ad hoc donations, and the council makes occasional awards from thsiu fund.
Library Fund This was initially the balance from a previous sale of surplus books from the Library which realized £3300, included in the 1995 accounts. Payments from the fund are at the authorization of council.
The **Hector Hockey fund** is treated as an endowment fund which sup[ports projects and has a set of rules under which the HHF Trustees work and recommend to Council any grants to be

made. It is represented by the National Savings Bonds and is part of the National savings Ordinary Account.

Milton Fund. Because the Hockey Fund attracted only small amounts of income as interest, and so only relatively small grants could be made, Council decided that £5000 of the bequest from Mrs Milton would also be put into income bonds and that income used to back up the Hockey Fund, working to the same rules as that fund. The Milton fund is not an endowment fund

Ornithology Section fund. This is reserved by the section as seed-corn funding should publ;ication of an avifauna of the county become feasible.

Sustrans/curry fund This operated in 2003 as a one-off. Grants were received from the geologists association Curry fund, and late from Sustrans. They were used to purchase banners for a geological event on the Bristol-Bath cycle path. The banners will be used in future.

13
Analysis of net assets between funds

	General Fund	Permanent Endowment	Special Funds	Total
Current Assets	10,858	5,377	24,852	41,087
Current Liabilities	-769	0	0	-769
	£10,089	**£5,377**	**£24,852**	**£40,318**

14
Statement of funds

	At 01.01.2004	Income & Transfers	Expenditure	At 31.12.2004	Dec 2003
General Fund	9,282	12,461	-11,654	10,089	9,282
Special Funds					
- Memorial Fund	15,844	1,349	-3,466	13,727	15,844
- Conservation Fund	1,387	456	0	1,843	1,387
- The Library Fund	2,889	104	-780	2,213	2,889
- Ornithology Section Fund	1,000	40	0	1,040	1,000
- Milton Fund	5,839	190	0	6,029	5,839
- Sustrans/Curry	0	0	0	0	0
Total Designated Funds	26,959	2,139	-4,246	24,852	26,959
Permanent Endowment					
- The Hector Hockey Fund	5,187	190	0	5,377	5,187
Total Funds	**£41,428**	**£14,790**	**(£15,900)**	**£40,318**	**£41,428**

15 Prior period adjustment This is the result of an over statement in debtors in the pervious years accounts.

INSTRUCTIONS FOR AUTHORS

The editor welcomes original papers on the natural history of Avon and surrounding areas for consideration for publication in the Proceedings. Inexperienced authors may obtain advice from members of the Publications Committee. Authors should remember that their readers may not be specialists in the particular subject, and that unnecessarily technical language can be a barrier to understanding.

All papers for consideration should reach the editor by the end of November for publication in the following year. If there is likely to be a problem with this, the author should contact the editor in advance. All Society Reports and Biota should reach the editor by the end of January in the year of publication.

Whenever possible, text should be submitted on a disk as a file produced using a recent word-processor program (preferably Word 2000). Please specify the software and version used. The disk and a final hard copy version of the manuscript, if submitted, should match exactly. The wording should follow the style and format of the Proceedings, i.e. Titles in 10pt Arial Bold and body text in 10pt Times New Roman on an A5 page. An abstract should be supplied, and the text should be organised with appropriate headings and sub-headings. Submitted manuscripts should be double-spaced with wide margins and printed on one side of the paper only. Authors should retain a copy. Captions to illustrations should be given separately at the end of the text. Abbreviations should be defined on first use, but these should be avoided in the abstract.

Originals, not copies, of photographs, slides, line drawings, diagrams and maps should be submitted, returnable on request. Drawings and other diagrams should not be more than twice final size and made in monochrome. Photographs may be submitted as prints in colour or monochrome. These will normally be reproduced in monochrome, though consideration will be given to their publication in colour. Graphs, charts and simple diagrams should be produced by computer graphics: advice and help with this are available. Permission to reproduce copyright material is the responsibility of the author.

References should be listed at the end of the text, in alphabetical order of the first author's name, and should take the following form. (with book and journal title in italics and first line hanging).

Book: Author (Date). *Title*. Place of publication: Publisher. - e.g.

Rackham, O. (1986). *The history of the countryside*. London: J.M. Dent.
Clapham, A.R., Tutin, T.G. and Warburg, E.F. (1952) *Flora of the British Isles*. Cambridge at the University Press.

Paper: Author (Date). Title. *Journal Name*, volume (part), page nos. - e.g.

Ross, S.M. and Heathwaite, A. L. (1986). West Sedgemoor: its peat stratigraphy and peat chemistry. *Proceedings of the Bristol Naturalists' Society*, **44**, 19-25.

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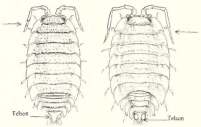

Rerum cognoscere causas - Virgil

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